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OFFSHORE RISKS

Tips on how to protect
your intellectual property

Page 78

**TEXTRON'S
CONSOLIDATION LESSONS**

How 41 business units and
9 CIOs agreed on 1 standard

Page 86

SCHRAGE ON BRANDING I.T.

Why you should—
How to do it right

Page 58

SINGLE INSTANCE ERP

Is It Right for You?
How to Decide

Page 64

BY BEN WORTHEN



"The worst thing to do," says
Rock-Tenn CIO Larry Shutzberg,
"is throw away what's working in
order to get to the end-of-the-
rainbow utopia."

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city alone at night.**

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VOL. 17 • NO. 4 • NOVEMBER 15, 2003

Cover Story

INTEGRATION | 64

Extreme ERP Makeover

The grand ERP vision of one application and one database for everything your company does may finally be achievable. But does that mean you should rip out all your systems and replace them with a single instance? Here's how to decide.

By Ben Worthen

COVER PHOTO BY STAN KAADY



Rock-Tenn CIO Larry Shutzberg says vendors are pounding down his door to sell him single-instance ERP. But he's not biting. Find out why he isn't—and why many other CIOs are—on Page 64.

Features

INTELLECTUAL PROPERTY PROTECTION At Risk Offshore | 78

U.S. companies outsourcing their software development offshore can get stung by industrial espionage and poor intellectual property safeguards. *By Michael Fitzgerald*

I.T. CONSOLIDATION 41 Business Units, 9 CIOs, 1 Standard | 86

Textron's IT consolidation effort is a political and leadership challenge of global proportions. Can the company find the right mix after years of operating independently?

By Stephanie Overby

WEBSITE REDESIGN How to Play to Your Audience | 96

Is your website easy for Maude to use? Or, for that matter, Tiffany or Raul? Here's how to sync up your website with your audience. *By Meridith Levinson*

CASE FILES | MOBILE COMPUTING No Frills Wireless | 104

Charged with keeping tabs on retail displays, Chuck Latham Associates turned to PDAs and custom software.

By Michael E. Kanell

BOOK EXCERPT | *THE INNOVATOR'S SOLUTION* What Customers Really Want Is for You to Do Their Jobs | 108

To make innovative products that drive growth, companies must forget about demographics, product attributes and market size data, and focus on the specific jobs customers need to get done.

By Clayton M. Christensen and Michael E. Raynor

MORE ►►►



"To take this whole flotilla of ships and turn them all around so that we become a networked enterprise is very difficult," says **Phyllis Michaelides**, Textron's chief technologist in charge of promoting technology standards.



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Tons of Space



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Columns

THE EXCHANGE

Six Ways to Boost Morale | 48

If down times have stalled your staff's productivity and depressed its outlook, add these tools to your management arsenal and watch them bounce back.

By Martha Heller

PEER TO PEER

Hands Across the Pond | 54

As the CIO of U.S. Can discovered, building a global IT shop takes flexibility, a respect for cultural differences and a tolerance for multiple pints of ale.

By Sheleen Quish

MAKING I.T. WORK

Time to Brand Your IT? | 58

Conducting an exercise in branding could help you manage user expectations and improve your department's image.

By Michael Schrage

REALITY BYTES

When (or if) the Boomers Say Bye-Bye | 120

Conventional wisdom holds that the mass retirement of the baby boomers will trigger a hiring frenzy. Conventional wisdom is wrong. *By Megan Santosus*

CAREER COUNSEL

Follow the Money | 124

If you want to be a CIO, it doesn't hurt to have a little CFO in you.

By Beverly Lieberman, Gerry McNamara and Mark Polansky

ESSENTIAL TECHNOLOGY | 129

Remote Possibilities

One way CIOs have eased their remote access headaches is through server-based computing, or SBC. Instead of sitting on laptops or PDAs, applications reside on servers. Users can connect securely to those apps via any device, and when an application needs updating, IT staffers need only do so on the server.

By Todd Datz



Sections

TRENDLINES | 32

Enhanced 911 off schedule; Outsourcing's bad blood; Turning photos into dollars; Digital notes on Lady Liberty. *And more*

OFF THE SHELF | 36

Two books on competitive intelligence: *Why Not?* and *Early Warning*.

CIO Best-Sellers.

WASHINGTON WATCH | 42

The Patriot Act debate heats up over data privacy and terrorism fight.

ESSENTIAL TECHNOLOGY | 129

Server-based computing is old news, but users find new reasons to keep it around.

By Todd Datz

UNDER DEVELOPMENT | 134

A new SCSI standard promises to take the venerable storage technology to a new level.

PUNDIT | 136

Do catastrophic power failures have something to teach us about keeping the data center up and running? *By Eric Knorr*

In Every Issue

FROM THE EDITOR

ERP: Second Time's the Charm? | 16

CIOs should be skeptical about having one ERP system and data store, no matter how appealing the prospect.

By Richard Pastore

WHAT WE COVER, WHO TO CONTACT | 28

CIO editorial contacts sorted by industry, and business and technology areas.

INDEX | 140

EXECUTIVE SUMMARY | 142

Abstracts of all the feature stories found in this issue.



“Secure Web access to our key applications without a single rewrite was, by itself, a huge benefit from using Citrix. In addition, Citrix cut annual telecom costs at our 370 dealerships by 40%.”

Joyce Vonada, CIO
AutoNation, Inc.



access

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INTERACTIVE >features

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ASK THE SOURCE

How Cutting Edge Do You Need to Be?

As retail merchandiser Chuck Latham Associates found out, not very (see **No Frills Wireless**, Page 104). And, as Case Files expert analyst Eugene Signorini says, picking the technology—in this case wireless—to fit the job is the best way to go. Got your own questions about implementing wireless and mobile applications? Signorini, senior analyst at the Yankee Group specializing in mobile and wireless enterprise applications, is ready to give you answers now through Nov. 30. Go to www.cio.com/ask.



Eugene Signorini

ADD A COMMENT

Will You Go for an Extreme ERP Makeover?

According to one study, 65 percent of companies are considering ERP consolidation (see **Extreme ERP Makeover**, Page 64). But doesn't Web services promise to allow the integration of standalone systems without having to rip—and replace—or tie your company's future to a single vendor? Either path will cost millions of dollars and take at least a year. Which will you choose? Share your thoughts and experiences with your peers by scrolling to the **ADD A COMMENT** section at the end of the online version of this story.

LEARN MORE

More Disruption

Clayton M. Christensen, author of *The Innovator's Dilemma* and *The Innovator's Solution* (for an excerpt, see **What Customers Really Want Is for You to Do Their Jobs**, Page 108), spoke to CIO between books about how CIOs can recognize disruptive innovations and rally their companies to take action. Read what he had to say in "Disruption Is Good."

Even More Consolidation

Companies going from a decentralized to a centralized organization face many challenges (see **41 Business Units, 9 CIOs, 1 Standard**, Page 86). To learn how telecommunications company Cingular went from a mélange of call centers cobbled together through years of mergers to a consolidated system, read "Call Together Now."



Clayton Christensen

* To find these stories online, search on the article titles or go to www.cio.com/printlinks.

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Online Exclusive

Coverage from CIO '04

If you couldn't make the **CIO Perspectives** conference earlier this month, check in online for summaries of what Lester Thurow, Jonathan Zittrain, and CIOs and IT executives from 11 leading companies had to say about the future impact of current issues and trends. Go to www.cio.com/cio04 to read all about it.

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From the Editor



For more details on the pros and cons of enterprise resource planning systems, visit our ERP Research Center at www.cio.com/erp.

ERP: Second Time's the Charm?

FORGET THE MULTIPLE point applications your company uses today. You need to rip them all out and replace them with a “single instance” ERP system—with one data store—that serves the entire company. That’s what SAP and other ERP vendors are telling CIOs, and companies seem to be listening to this siren call. This, despite the fact that it will cost millions. AMR Research predicts that moving to single instance will run you \$7 million to \$12 million for every billion dollars of revenue, and the project will last one to three years.

Why aren’t CIOs dismissing this out of hand? Wasn’t the failed effort (and wasted millions) on monolithic ERP implementations in the 1990s the main reason for today’s backlash against IT expense and the decline in CIO credibility? Haven’t CIOs embraced a better alternative and greater wisdom in implementing and integrating multiple best-of-breed apps across the enterprise? (In fact, we wrote about this trend in a story titled “This Could Be the Start of Something Small,” in our Feb. 15, 2003, issue.)

So what gives? Well, having one ERP system

and data store remains a very appealing—if intimidating—vision. It reduces total cost of ownership, helps companies comply with new Sarbanes-Oxley rules and makes exploitation of customer data much easier. What’s happened that makes this a different proposition than in the 1990s, we learn in Ben Worthen’s story on Page 64, is the greater availability of bandwidth, the increasing viability of enterprise-size databases and the drop in storage costs. Not to mention the fact that we don’t have Y2K to distract us (although Sarbanes-Oxley compliance could be pretty diverting).

Still, although AMR says 65 percent of companies are considering single instance, I wonder if any enterprise that got burned once would go through with this again. Have we learned enough about project management, business buy-in, end user training, adaptation of business processes, change management and the other traditional ERP challenges in order to make it work this time around?

What do you think? Will your company try, try again or tell SAP to take a hike?

Richard Pastore, Deputy Editor
pastore@cio.com

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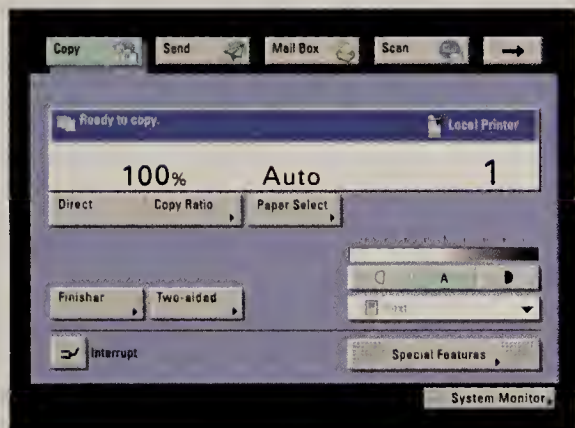
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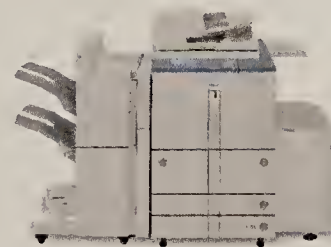


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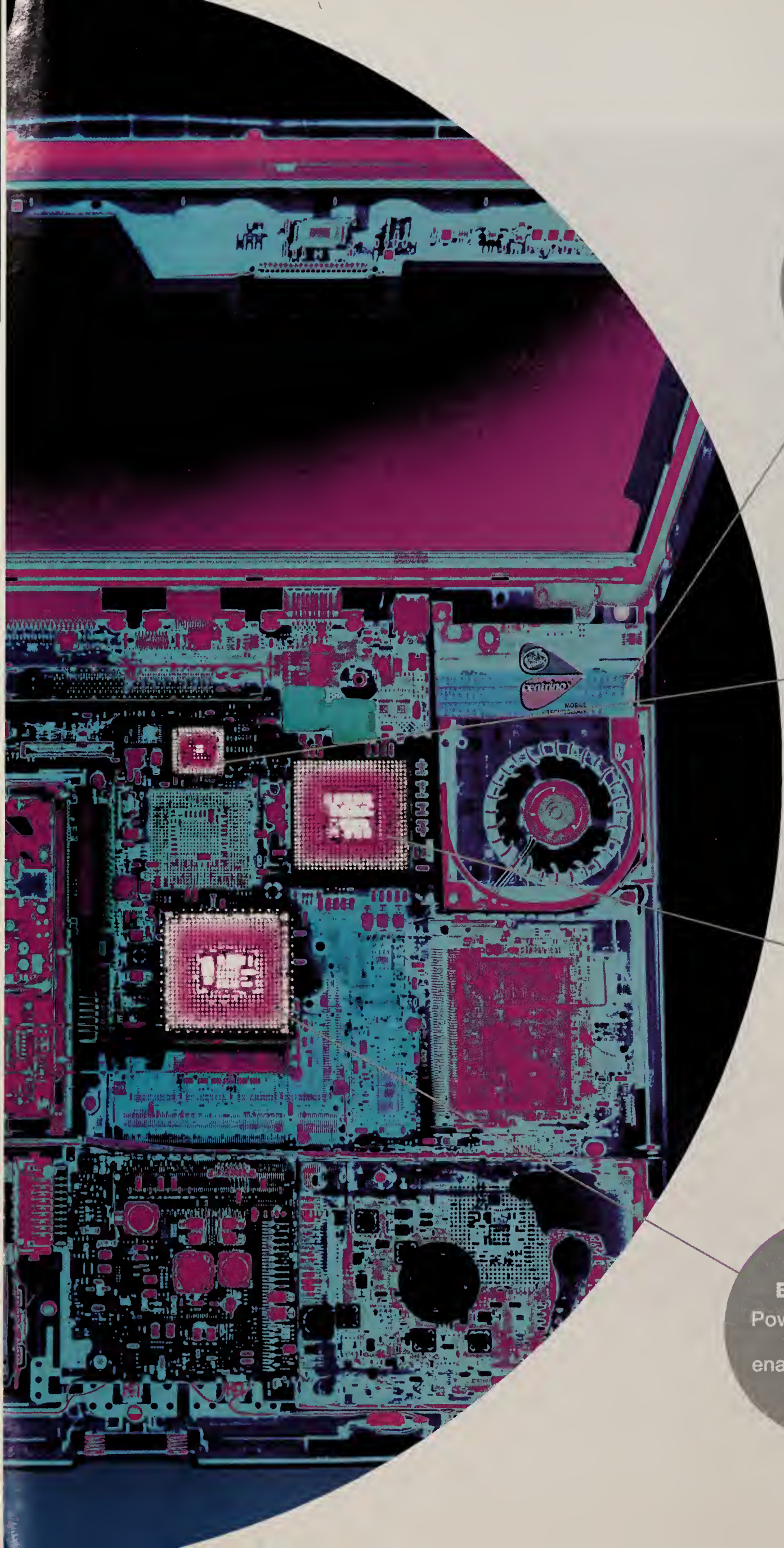
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trendlines

the **NEW** the **HOT** the **UNEXPECTED**

Edited by Michael Goldberg

WIRELESS COMMUNICATIONS

Enhanced 911 Far Behind Schedule

THE NATIONWIDE rollout of the Enhanced 911 (E-911) program, which requires carriers to locate the origin of 911 calls from wireless phones, will probably not happen by the Federal Communications Commission's Dec. 31, 2005, deadline. That's what John Muleta, the head of the FCC's wireless bureau, told Congress in June.

Ironically, the reason has nothing to do with wireless technology and everything to do with the old, wired communications infrastructure.

When the E-911 rule first came out in 1996, the onus was on the wireless carriers to develop technologies by October 2001 that could pinpoint callers. That was the first step on the way to E-911. And while carriers won delays to extend the deadline to 2005, they have solved the technical challenge using two techniques: global positioning system chips that use satellites to locate mobile phones, and signal triangulation, which detects radio signals from calls to locate their source.

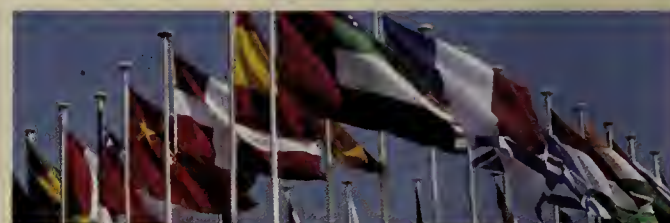
So the real problem now is communicating the location information to the emergency service dispatch centers known as public safety answering points, or PSAPs, that field 911 calls, says Dale Hatfield, the former chief of the office of engineering and technology at the FCC.

Continued on Page 34



OFFSHORE OUTSOURCING

Bad Blood



BULGARIA. CHINA. EGYPT. INDIA. The Philippines. Romania. At the September New York City trade show called TECHXNY, floor space dedicated to offshore outsourcers represented a virtual United Nations of vendors seeking deals with American businesses.

Just one problem for the visitors: Not much deal-making was going on. In fact, vendors staffing their booths at the end of the show had plenty of time to talk about the growing U.S. backlash to offshore outsourcing.

Nico van Rooyen, director of market development for B&Ti Solutions, a specialist in services for financial and insurance industries in Johannesburg, South Africa, says he was subjected to jeers. "A couple of people were here, pointing at me and telling me about how we are taking jobs away—they were quite militant," he says.

Van Rooyen's experience seemed to be an exception, though others say they are aware of the sentiments.

George Sharkov, chairman of Basscom, an association of Bulgarian software companies, made the trip from eastern Europe to market his country's software programming prowess. "We want to establish long-term relationships with American companies," he says. "But you cannot tell us it's our fault for taking jobs away. If the jobs don't come to us, they will go somewhere else—businesspeople want to get high quality in the most cost-efficient way possible, and if they can see that can be done outside the United States, they will do it."

—Marc Ferranti



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Enhanced 911

Continued from Page 32

The current wired phone network has two channels—one for conversation and one for related information, such as length of call and destination, that make billing possible. It's an analogue system, which is at least a generation behind the digital wireless network. As such, it just can't handle the complex information that comes from a wireless carrier. Furthermore, the PSAPs themselves are using old systems. In order for E-911 to work, both the wired communications infrastructure and the systems inside the nation's 5,300 PSAPs will have to be upgraded, Hatfield says.

Theoretically, two years should be enough time to replace the infrastructure. However, it is up to cash-strapped individual communities and the states to make the necessary changes. Only a handful of states, including Rhode

Island and Tennessee, look ready to meet the 2005 deadline, according to the FCC.

The House is expected to vote on a bill by year-end that is designed to address this shortcoming. The E-911 Implementation Act would set aside \$500 million to help pay for the E-911 infrastructure and prohibit local jurisdictions from diverting those funds to other budgetary needs. The bill also would set up a national coordination office for the program at the Commerce Department.

That may answer some critics of the E-911 implementation who have said that there isn't enough oversight at either the state or federal level. Most states don't have E-911 coordinators, and some don't even have cost recovery steps in place, such as a 50-cent monthly fee added on to consumers' mobile phone bills.

Even if the House passes the bill, however, the money is only enough to fund a few demonstration projects, says Hatfield, who is now a professor at the University of Colorado.

Since the summer, FCC officials have linked E-911 to national security in an effort to jump-start the states' progress. A Senate bill would require local emergency dispatch centers using federal money to cooperate with both the FCC and the Department of Homeland Security. But project management and coordination is so far behind in some places that even an influx of money and other resources may not be enough to put things on track in thousands of local jurisdictions by 2005. "If they haven't taken these steps by now, it's unlikely they'll be ready," says Hatfield. —Ben Worthen

VENDOR MANAGEMENT

Score One for Mobile Phone Users

THANKS TO A Federal Communications Commission mandate, wireless carriers are about to lose one of the biggest bargaining chips they have over their corporate customers—number portability.

Business users have been reluctant to switch carriers because getting better service or a better rate wasn't worth the hassle of getting a new phone number, says Joe Basili, vice president of marketing for Teldata Control, a company that helps large businesses manage their telecom expenses. The new rules, which will allow users to switch carriers and keep their phone numbers, go into effect Nov. 24.

Basili says this is good news for IT executives because they may now be able to squeeze better volume discounts from carriers. This will make it much easier to move all of their users to one service, though the process may take two or three years to complete. "This is a chance for enterprises to get their arms around cell phones and manage them like other network services," Basili says.

Companies such as MSS Group, RFD Systems and Teldata are part of a growing segment of business process outsourcing called telecom expense management. According to a preliminary forecast by Gartner, the telecom expense management market will reach \$500 million by the end of 2003, on its way to \$2.5 billion in 2007.

Eric Goodness, an analyst for Gartner's Dataquest IT services group, says telecom expenses consistently rank among the top five IT expenditures because of decentralized cost control and the



complexity of telecom billing. Outsourcing telecom management is one way companies can better detect billing errors (which typically result in 10 percent to 15 percent in overcharges, according to Gartner) and collect data to renegotiate their deals when appropriate.

"It's all about savings," Goodness says. "Having good visibility into your contracts is great, but if you're not saving money, who cares?" —Jon Surmacz



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Off the Shelf

Edited by Carol Zarrow

Making Use of Competitive Intelligence and Ingenuity

Two books urge executives to go outside—both literally and figuratively. The first focuses on the importance of competitive intelligence. The second offers ways to bring innovation to daily tasks.

Early Warning: Using Competitive Intelligence to Anticipate Market Shifts, Control Risk and Create Powerful Strategies

By Ben Gilad
Amacom, 2003, \$27.95

AS THE PACE of change in the business world accelerates, so do the associated risks. Such a cycle translates into a greater potential for surprise, something that executives should strive to avoid at all costs. Those are the premises behind Ben Gilad's book on competitive intelligence, an effort that aims to show executives

how to assess the impact of outside events on the operations of their companies.

Gilad introduces readers to his "competitive early warning system," a process that combines competitive intelligence, strategic planning and management action. The goal of an early warning system, he says, is to identify risks and strategic missteps before they elevate into crises. The book offers checklists, quizzes, charts and anecdotes designed to help readers identify, prioritize

and manage risks. There are also tips on how to take advantage of competitive opportunities, as well as caveats about benchmarking and relying on consultants. This book won't make readers into experts on competitive intelligence, but it will put them on notice about the importance of paying attention. As Gilad points out, being a nimble competitor is a matter of constant diligence. —Megan Santosus

Why Not? How to Use Everyday Ingenuity to Solve Problems Big and Small

By Barry Nalebuff and Ian Ayres, Harvard Business School Press, 2003, \$27.50

IN *WHY NOT?*, authors Barry Nalebuff and Ian Ayres challenge readers to come up with low-tech solutions to both niggling nuisances (such as stymieing telemarketers) and major conundrums (such as preventing your home from losing value). The two men—professors of economics and law, respectively, whom you may have heard clowning around on National Public Radio's *Marketplace*—maintain that innovation is a skill that can be taught, and they offer four basic tools for those who wish to learn it.

The tools are essentially four questions that people can ask when they're faced with a problem, whether it be an inefficient business process or a way to ensure good corporate governance: How would you solve the problem if you had unlimited resources? Would different incentives solve the prob-

CIO Best-Seller List

Reefer Madness: Sex, Drugs, and Cheap Labor in the American Black Market

By Eric Schlosser
Houghton Mifflin, 2003

24 Days: How Two Wall Street Journal Reporters Uncovered the Lies that Destroyed Faith in Corporate America

By Rebecca Smith and John R. Emshwiller
HarperCollins Publishers, 2003

Purple Cow: Transform Your Business by Being Remarkable

By Seth Godin
Portfolio, 2003

Execution: The Discipline of Getting Things Done

By Larry Bossidy and Ram Charan
Crown Publishing Group, 2002

Good to Great: Why Some Companies Make the Leap...and Others Don't

By Jim Collins
HarperCollins Publishers, 2001

SOURCE: Data for the month of September 2003, compiled by Powell's Books, Portland, Ore.

lem? Is there a solution to another problem that might apply to the problem you're facing? What if you tried finding a solution, not to the problem itself, but to its reverse? The authors provide step-by-step exercises and case studies explaining how to apply each tool, as well as brainteasers that encourage readers to try out the questions for themselves. The only question left to ask yourself is, Why not give this book a try?

—Meridith Levinson

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GLOBAL I.T.

It Takes a Corporation to Wire a Village

IN KUPPAM, INDIA, people earn less than \$1 a day. Few go beyond eighth grade. They're mainly sugar cane and peanut farmers. And after the sun sets on their labors, they visit their local Internet café to learn how to grow more peanuts and cane, deal with India's baroque bureaucracy, or look for the education, grants and jobs that will get them out of those steamy fields forever.

Through a three-year project that began in February 2002, Hewlett-Packard plans to spend \$3 million in Kuppam, a community of 300,000, to bring Internet access to 15 local business centers. These business centers already offer copy and fax services, but HP has been stringing 2 megabit lines into these centers and populating them with computers loaded with software designed for Kuppam's limited literacy levels. HP even built an 802.11 wireless network for mobile units designed to travel to the outreaches of Kuppam.

"The biggest challenge we found was the gap between those offering services and the people needing them," says Anand Tawker, who grew up east of Kuppam in Chennai, India, and is HP's leader of the project, called I-community. For example, Tawker says, a farmer could travel an entire day to a government office in another city in search of a specific agricultural grant form, only to find it wasn't there. Or be told that the form costs \$25—when, in fact, it was free.

Now, the farmer can fill out and send those same forms from the café for an approximate Internet usage fee of \$1.50. Tawker estimates a cost of \$2.50 to \$5 for filling out the form the old-fashioned

way, taking travel into consideration but not counting bribes.

For HP, I-community is a chance to see which services might be profitable in India, says Maureen Conway, an HP vice president of emerging market solutions. (One idea: a pay-per-use model for Internet access.) It seems that HP can bank on winning goodwill. Kuppam's first Internet café opened in April 2002, and within the first 40 days, more than 1,600 people logged on. —Julie Hanson



Residents in Kuppam, India, stand outside a mobile vehicle equipped with PCs and other equipment, as part of a project to bring Internet access to the rural agricultural area.

ASSET MANAGEMENT

Turning Photos into Dollars

TO MANY PEOPLE, jets and cars are not products—they're icons. Companies such as Boeing and General Motors have long viewed consumer passion about their brands as assets. But fulfilling the many requests from the public for photos is an administrative headache that can cost up to hundreds of thousands of dollars per year when labor expenses are included.

By combining digital-imaging technology and an e-commerce back end, however, Boeing and GM have converted this time-consuming task into revenue. Each company recently outsourced management and distribution of its photo archives to Getty Images, a large commercial image bank. Getty set up two business-to-consumer websites—BoeingPhotoStore.com and GMPhotoStore.com—that each offer more than 1,500 images to buy. The sites act as a front end for Getty's fulfillment systems, which handle printing, distribu-

tion and billing.

Boeing launched its photo store website at the end of 2002. "Previously, [our] people would pull photos out of drawers and call some remote corner of the company," says Sandra Andrews, director of trademark and copyright licensing for Boeing. The calls might get funneled to the communications office or languish unanswered. Now, the photo store site gets 65,000 monthly visitors (60 percent from outside the United States). An average order is for two to four photos, for \$50 to \$60. That's enough revenue that BoeingPhotoStore.com is already close to being profitable, even counting up-front costs for archiving and scanning images. (Boeing declined to cite its project's cost.)

Andrews says the quick ROI is "nice," but



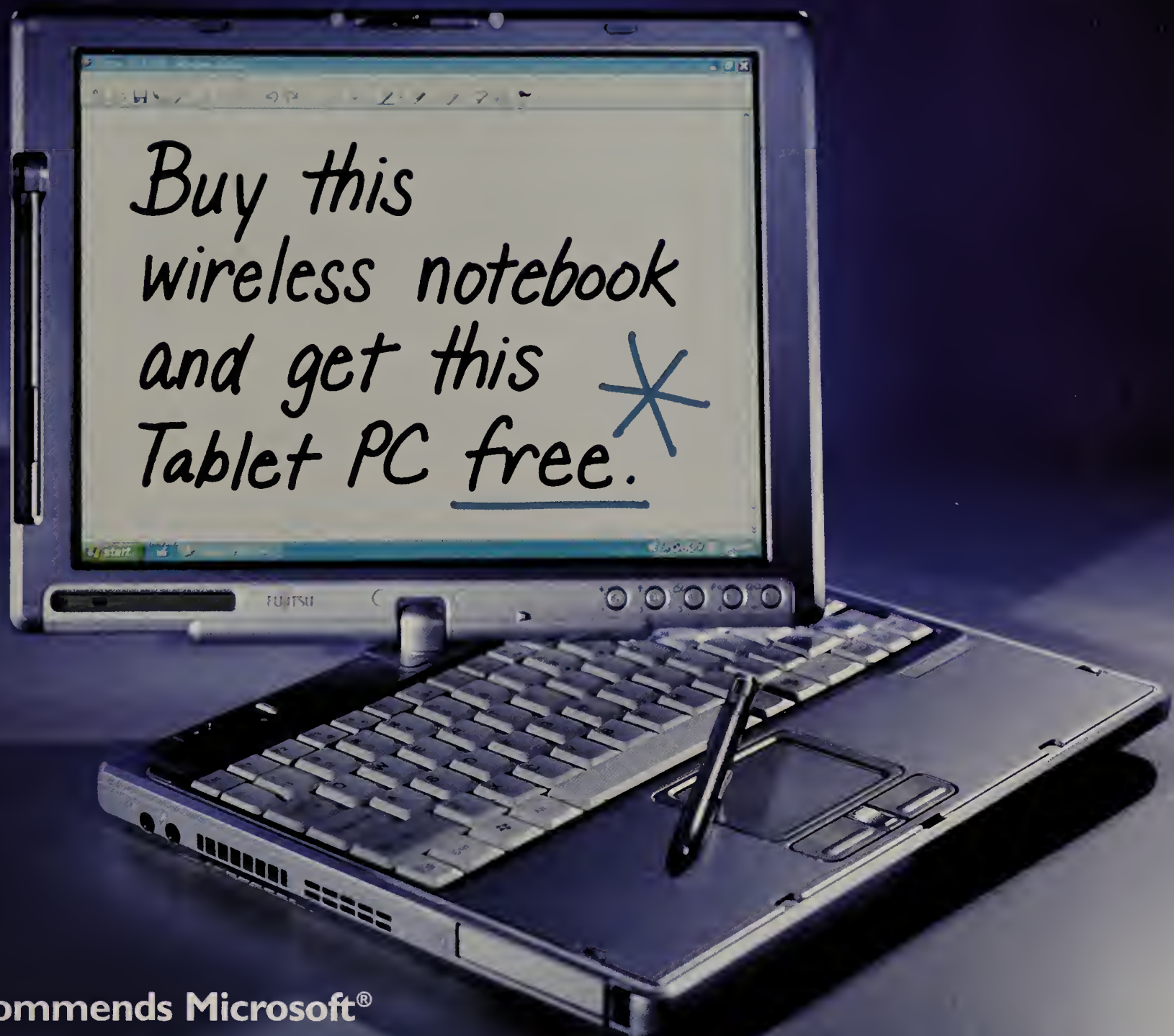
F/A-18 Hornet

the biggest benefit to Boeing comes in avoided administrative costs. "We measure success by how many requests come to us from various sources" outside the website, she says. The phone calls have almost dropped to zero. And the site helps the company boost awareness that Boeing makes more than airplanes, Andrews says. Many of the images are of

aerospace and military products, such as the F/A-18 Hornet in aircraft carrier operations.

Boeing and GM are the beachhead for a push into corporate image marketing by Getty. The photo store concept "probably appeals to 100 companies worldwide, whose imagery has broad consumer appeal," says Pete Peterson, Getty's director of media management services. "We joke that it's trains, planes and automobiles."

—Edward Prewitt



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Washington Watch

Edited by Elana Varon

P A T R I O T A C T

Debate Heats Up Over Data Privacy, Terror Fight

THE USA PATRIOT ACT is becoming one of the most polarizing pieces of legislation ever. Passed in the aftermath of Sept. 11, 2001, with little debate, the law and its provisions aimed at fighting terrorism greatly expand the power of law enforcement to search homes or offices and demand that businesses and libraries hand over their patrons' records. Today, the law is viewed as either an important tool in the war on terrorism or a pernicious threat to civil liberties—depending on whom you ask. With key portions of the law scheduled to expire at the end of 2005, the fate of the feds' new powers is emerging as an issue in the 2004 presidential campaign as well as on Capitol Hill.

Of the five Democratic presidential candidates who are in Congress, only Rep. Dennis Kucinich (D-Ohio) voted against the Patriot Act two years ago. Now all of them—spurred by angry would-be voters—have made bashing the law a regular campaign event. Meanwhile, three proposed bills would amend or repeal sections of the law. One, an amendment to a spending bill that would withhold funding for search warrants that are kept secret from the people they are targeting, easily passed the House (at press time, the measure was stalled in the Senate). And bipartisan legislation called the Benjamin Franklin True Patriot Act, sponsored by Kucinich and Rep. Ron Paul (R-Texas), would rescind several provisions of the original Patriot Act. In early October, a bipartisan group of senators led by Larry Craig (R-Idaho) introduced the Security and Freedom Ensured Act (Safe Act), which would limit the Patriot Act's use of

warrants, wiretaps and surveillance.

Much of the backlash is directed at Section 215, which allows the Department of Justice to obtain without a warrant personal and business information about such things as library books borrowed, purchases made with credit cards, medical records and school grades, and makes it illegal for anyone to disclose that they have been asked for information. During the summer, an internal Justice Department investigation concluded that DoJ employees had committed multiple civil rights violations while applying the Patriot Act.

CIOs Face Disclosure Pressures

In response to growing criticism, Attorney General John Ashcroft in September released a statement saying that Section 215 has never been invoked. But interviews with three corporate executives by *CIO*, none of whom would agree to be named, indicate that the law has created a climate for business in which protecting the privacy of customers who are not terrorist suspects is

threatened. The executives say that in most cases investigators get what they want just by asking. And that's bad for business. JetBlue customers filed two lawsuits over the airline's decision to share 5 million passenger records with a government contractor for a research project, which is in violation of JetBlue's privacy policy.

Despite the outcry, the Bush administration advocates for strengthening the Patriot Act. The Domestic Security Enhancement Act, also known as Patriot II, would eliminate the 2005 expiration date and broaden the definition of terrorism. This proposal was leaked early this year and touched off a storm of controversy, all but killing its chances. Ashcroft maintains, however, that the Patriot Act has prevented other terrorist attacks, and that the same investigative techniques included in the Patriot Act have been used for decades to combat illegal drug activity and other criminal behavior.

But Jonathan Zittrain, codirector of the Berkman Center, a technology policy think tank at Harvard Law School, says using the same techniques to investigate both terror and nonterror crimes would put even more pressure on companies to balance the privacy rights of their customers with their desire to cooperate with law enforcement. At minimum, CIOs would spend a lot more time meeting with their lawyers.

—Ben Worthen

Patriot Act Scorecard

There are plenty of ideas for changing the antiterrorism law



Attorney General John Ashcroft
Wants to use same techniques to investigate both terror and nonterror crimes.



Rep. Butch Otter (R-Idaho)
Would withhold funding for search warrants that are kept secret from their targets.



Rep. Dennis Kucinich (D-Ohio)
Would repeal key provisions, including power to seize business records.



Sen. Larry Craig (R-Idaho)
Wants to limit warrants, wiretaps and surveillance.

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CULTURAL HERITAGE

The Digital Preservation of Lady Liberty

IT tools can help preserve important landmarks and works important to human history. One problem: the uncertain shelf life of digital media.

WHEN 22ND CENTURY conservators need to clean or patch the Statue of Liberty, they'll have a wealth of details to draw on—provided they can access the data and make heads or tails of their predecessors' notes on the monument's condition and the work done on it.

The plundering of ancient Mesopotamian sites after the United States's invasion of Iraq brought the issue of cultural preservation to the fore. It turns out that IT tools, from websites that give virtual tours of important landscapes to digital archiving technologies, are valuable in efforts to document objects and sites of cultural significance. But the same tools that help researchers now may not leave a lasting record. Because while cryptic notes about relics can be puzzled over for as long as the paper holds up, information that winds up on a software or media format that has a limited shelf life might as well be sealed in a long-lost tomb. (See "Standards for Posterity," below.)

"It's almost to the point that we're not quite sure what we need to know [in the future], so we're going to collect as much of this data as we can, extremely precisely," says Stephen Spaulding, northeast regional chief of the National Park Service's architectural preservation division.

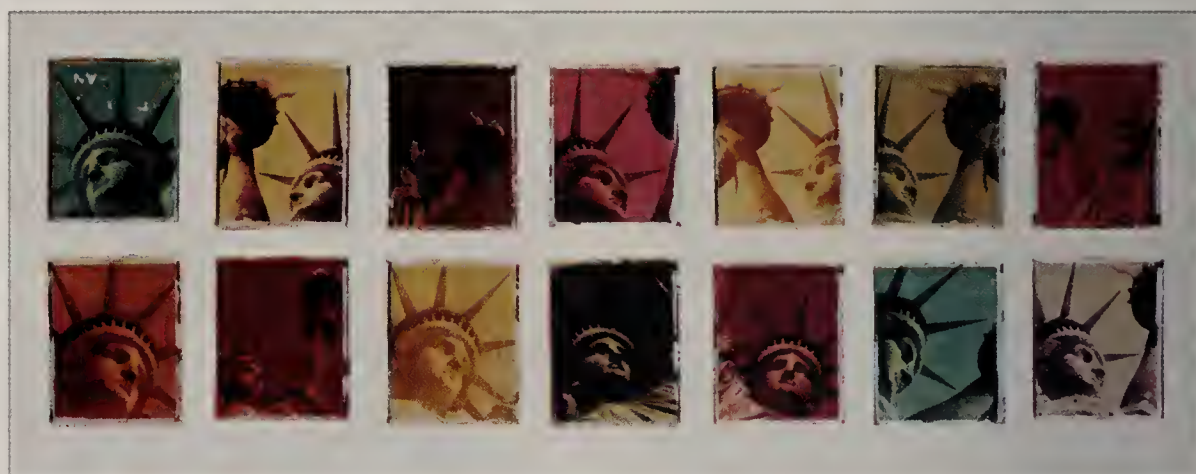
Even with this long-term uncertainty, the Web has become a popular vehicle for preservation, as high-profile sites dedicated

to Iraqi heritage, Roman ruins, Japanese temples, even Michelangelo's David, attest.

The most advanced websites represent an evolutionary leap beyond the rough assemblages of photographs, video clips, rudimentary computer animation and field notes that typified early attempts at assigning computers to the job of preservation. They combine detailed scientific, historical and cultural

preserve natural and man-made cultural heritage. The field encompasses everything from national park websites and museum exhibits to multimedia hubs for archaeological digs. It involves the use of digital communications and collaboration technologies that connect conservateurs.

The National Park Service last year took precise measurements of some iconic Amer-



information with advanced imaging, virtual reality tours and collaboration tools.

The National Park Service digitally archives and disseminates information on many of its sites, and the United Nations' agency Unesco last year launched a website (www.virtualworldheritage.org) to foster the conservation of the U.N.'s 754 World Heritage sites.

But websites are just part of the picture. Virtual preservation, broadly defined, is any digital documentation effort intended to

ican monuments, such as the Statue of Liberty and Mount Rushmore, using 3-D laser scanners adapted from the energy and engineering industries. They also recorded and digitally archived ambient temperature, moisture levels, wind direction and speed, and other conditions affecting the monuments.

Environmental Data Tracked

While this data might help in the reconstruction of a damaged monument—the project was widely reported as a response to the threat of terrorism—the goals include maintenance and education.

"We want to gather sufficient and precise data on the environmental performance of the [Statue of Liberty's copper] skin, so a hundred years down the line they're able to minimize erosion of the copper," Spaulding says. Proponents point out that virtual preservation has the potential to keep the public from "loving" sites to death. Web presentations, if they cut traffic at the actual sites, can reduce damage from the trampling, fingering and breathing of visitors.

But preservationists are also holding their breath that today's digital presentations will last until tomorrow. —Ted Smalley Bowen

Standards for Posterity

THE BENEFITS OF virtual preservation could be short-lived if archiving and standards are not addressed.

XML tags and metadata can help researchers annotate multimedia content, but preservationists need to hash out uniform methodologies and interchange formats, while somehow avoiding the all-too-familiar standards pitfalls such as the difficulty of keeping them current, according to Alonzo Addison, an adviser to the director at the Unesco World Heritage Center and director of the University of California at Berkeley's Center for Design Visualization. "By the time you agree on a standard, it's obsolete," he says.

Copyright enforcement also threatens to limit virtual preservation's potential by preventing the free exchange of data, images and other works, he adds. —T.S.B.

A black and white photograph of a person rock climbing a steep, layered rock face. The climber is wearing a t-shirt, shorts, and a harness, and is secured by a rope. The background shows a vast, open landscape with more rock formations under a clear sky.

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Study proves it: OptimalJ[®] significantly improves J2EE

The Middleware Company, an independent Java consulting firm, recently performed a study to compare developer productivity in two different development environments: traditional, code-centric IDEs, and the Model Driven Architecture (MDA) approach as defined by the Object Management Group (OMG). Two teams—one using Compuware OptimalJ and another using a market-leading code-centric IDE—spent four weeks creating the same J2EE application with comparably skilled developers. The results: Using MDA with OptimalJ demonstrated significant productivity and quality improvements over traditional development approaches.

Independent consultant David S. Frankel, an expert in the architecture, design and development of complex, distributed enterprise computing systems, has analyzed the results of the study. His outlook, summarized here, reviews the implications of the study for the IT executive.

Reviewing the productivity results

The study recorded the time each team required to construct the application. As the table in the sidebar shows, the MDA team finished in considerably less time than the traditional team.

Reviewing the quality results

Although this was primarily a productivity study, the study's expert organizers inspected the code the two teams produced and found the two sets of results were of good and roughly comparable quality. An automated check for acyclic dependencies, a common indicator of code quality, also produced favorable results for the two teams.

Interpreting the results

The fact that the MDA team's productivity was significantly higher during the initial development phase is

particularly interesting. Responsible MDA proponents who seek to be properly circumspect when making claims usually caution that the bulk of the ROI for MDA is likely to be realized not in the development of the first project, but over the full life cycle of multiple projects. This ROI outlook stems partially from the fact that there is a learning curve when using any new tool, and another one when adopting a new approach to development. It also is due to a number of advantages that accrue for MDA users over the medium to long term:

- Having a consistent, proven architecture across a number of applications makes managing the applications easier.
- The use of generators assures that the same, consistent architecture will be followed even when maintenance teams who change the applications are not composed of the same people who developed the applications.
- The business-oriented nature of formal models makes it easier to identify the parts of a mature system that need to change to reflect a change in business conditions.

These points make a strong case to an IT manager, but can still leave the manager wondering how painful

development productivity

the early stages of the uptake of MDA are likely to be. However, *this study indicates significant ROI even on the first project*, and even when tracking just the development phase.

Since the MDA team was using a new tool and MDA for the first time, it is safe to expect that a follow-up study with the same teams using the same tools, building a different application, would probably result in an even larger productivity effect.

Now is the time to get started

Since MDA is a relatively new technology, some IT managers may prefer to wait to move on it, since we are bound to see improvements in the technology over the next few years. If the benefit of MDA were simply having a better development tool, waiting might be a sensible approach. However, the MDA value proposition goes beyond the immediate gain of an efficient software development tool. MDA offers:

A new relationship between IT and the business: The fact that MDA models are less technically oriented and more oriented to business concepts allows IT to respond more directly to shifting strategies that the business devises.

The ability to leverage top technical talent: By organizing special architecture teams to supervise the definition and maintenance of the architectural patterns that MDA generators use, IT can magnify its power to leverage the talent of its brightest and most experienced people.

New career opportunities: IT managers can extend a new career ladder to developers willing to make the cultural shift that MDA requires. The message to programmers: "We still need you, if you are willing to combine challenging technical work with a perspective that is closer to the concerns of the business."

For these advantages and others, it is wise to get started with a deliberate transition process now.

OptimalJ customers are reporting 40 to 90 percent productivity savings when building or maintaining applications. Call 1.800.COMPUWARE to capture similar results immediately.

To obtain The Middleware Company case study, visit offers.compuware.com, offer code 309CX10; or offer code 30A5X4 for the David S. Frankel report.

OptimalJ: The shortest path to greater J2EE development productivity

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End results:
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TEAM	ORIGINAL ESTIMATED HOURS	ACTUAL NUMBER OF HOURS
Traditional Team	499	507.5
MDA Team	442	330

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Six Ways to Boost Morale

If down times have stalled your staff's productivity and depressed its outlook, add these tools to your management arsenal and watch them bounce back

IN 1999, IT WAS FUN TO MANAGE I.T. WORKERS. You were liberal with bonuses, provided a stream of sexy new projects and created a career path filled with opportunity. Now, your job as manager is not quite as much fun. The specter of layoffs hangs in the air. Training has disappeared and, for many IT workers, so has the dream of a successful career in IT. No wonder your staff is a little depressed.

But according to members of the Best Practice Exchange, you can keep morale up when the chips are down if you include six basic elements in your management toolkit.

1 Training. Skills development is probably more important to IT workers than to any other type of employee. So get rid of the parties and the vending machines, but keep a decent training fund in your budget. And try some cheap alternatives. Working with corporate training and development, CIO Sheila Beauchesne of Martha Stewart Living Omnimedia secured state grants to help fund her IT training budget. The grant from New York covered 50 percent of her IT training budget for New York-based employees, and the Connecticut grant covered some vendor training for her employees there. "The best way to find training grants is to go to the website for the Department of Labor for your particular state," she says. "Most have funds for training, which they use as a tool to recruit companies and retain jobs in their states. Some funds are set up specifically for technical training."

Steve Agnoli, CIO of Kirkpatrick & Lockhart, arranged a Microsoft-led .Net concepts and applications training course for his sys-

tems development staff at no charge to the firm. The class provided an informed evaluation of how the .Net framework might work at Kirkpatrick & Lockhart, and Microsoft benefited from showcasing its new technology solution to an eager client audience.

2 Recognition. Whether your balance sheet is in the red or black, your people want to know that they matter, and proving it to them doesn't have to cost a fortune. Here's an idea that works for Lee Lichlyter, VP and CIO of Butler Manufacturing: Every quarter, IT staffers nominate peers for an outstanding effort in technical wizardry, service excellence or value creation. Staff and senior management vote, and the winners receive a modest cash award and a giant silver cup engraved with their name, which they keep until the next quarter.

3 Financial rewards. Let's face it, money talks. So make sure that even in tight times you dip into the pot, especially for your "A" players. "Despite some recent layoffs, we continue to reward outstanding performance with

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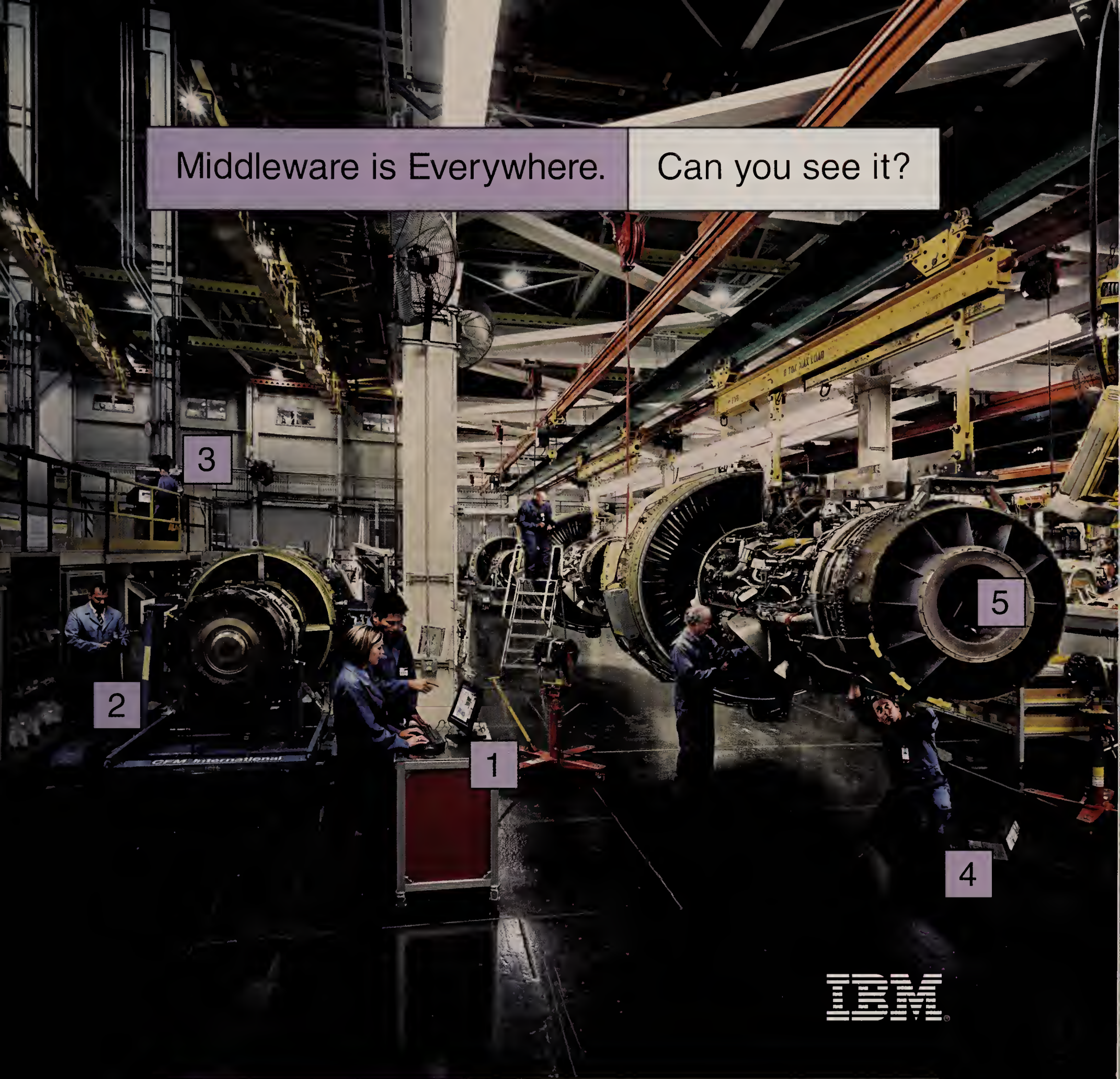
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spot bonuses," says Tom Smith, CIO of Waste Management. "And we have reaffirmed that our 401(k) match and similar benefits have been retained. All of these statements let our employees know that Waste Management will continue to treat them as the valuable assets they are."

4 Communication. The combination of fear and ignorance is powerful, indeed, so keep your employees in the loop. Weekly meetings, open-door policies and regular visits with employees will help quell the rumors that are often damaging to staff morale. "Our CEO has a quarterly 'all-hands' call in which he tells everyone what we've done and what our plans are," says Bob Odenheimer, senior VP of IT at Magellan Behavioral Health. "Thirty minutes of narrative and 30 for questions are a big help with staff morale. You'd be surprised what it means to employees when they can ask their CEO direct questions and get a real answer."

5 Alignment. As Andrew Dillane, IT director at CNC Global, puts it, "There is a direct relationship between morale and an individual's ability to contribute." So make sure all members of your IT staff get to sink their teeth into the projects that bring the most value to the enterprise. Soon after he became CIO of The Huntington National Bank in March 2001, Joe Gottron and his

team worked closely with the business units and the finance department to replace an ineffective "all you could ask for" work-request system and a "who you knew" prioritization system with a chargeback process for application development and project management. This new process has dramatically improved productivity and morale. "The new process provides interconnectivity between projects, budgets and resources," says Gottron. "Today, business unit priorities are very clear, and the technology team knows that what they're working on truly matters to the business. That creates a great deal of energy and motivation."

6 Leadership. Jeff Chasney, CIO of CKE Restaurants, contributes up to 2 percent of his annual salary for recognition parties, employee events, dinners and employee awards. Scot Klimke, vice president and CIO of Network Appliances, directs his more seasoned staff to work with the Gen X-ers and to give them the assurance that economic downturns do inevitably come to an end. Now is the time to look up from your spreadsheets, take a minute between meetings and use all of your leadership energy to make life a bit more pleasant for those who have chosen to follow you. (To learn more about boosting staff morale, visit www.cio.com/printlinks to read "Staff Alert.")

PEERCOUNSEL

» Six Sigma



Q: We are considering using Six Sigma in my organization. Can someone who has experience with it provide some lessons learned?



A: At J.P. Morgan Chase, Six Sigma is the business process reengineering (BPR) methodology. The company

has adopted the methodology, trained people on it and certified them as experts. The rigor of Six Sigma has given us a great framework for creating clear deliverables and for measuring process improvements. Some lessons learned:

- 1. Make sure** you have management commitment. You cannot take a serious BPR approach to automation projects without it.
- 2. Pay attention** to the relationship between your Six Sigma BPR and the software development lifecycle you have in place. Make sure the touch points between the BPR and the architecture efforts are clear and that deliverables are aligned and clearly defined. The project's governance body should have representation from the business, Six Sigma, operations and technology.
- 3. Six Sigma provides** a rigorous set of tools for defining goals and measuring baseline and improvements. It also includes a "voice of client" element used to understand clients' perceptions of existing processes and how they should be improved. The business community needs to understand how well the project is tracking to its goals, which are aimed at solving issues that clients consider most important.
- 4. Be flexible** and work in iterations. Any major project takes time, in large measure because the business environment continues to change while analysis and implementation efforts are under way. Be ready to iterate, and continually refine your reengineered processes and their automation. (Read tips from Seagate Technology CIO Mark Brewer in "Six Sigma Comes to IT," online at www.cio.com/printlinks.)

—JOSEPH DAFNI, VP, CHIEF BUSINESS TECHNOLOGIST (IN GCRM TECHNOLOGY), J.P. MORGAN CHASE

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ON THE I.T. ORGANIZATION

It would be great if we, as CIOs, could determine what a perfect IT organization would look like. Then all we would need to do is implement it and head for the golf course.

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Hands Across the Pond

As the CIO of U.S. Can discovered, building a global IT shop takes flexibility, a respect for cultural differences and a tolerance for multiple pints of ale

BY SHELEEN QUISH

I'VE FORGOTTEN MY HIGH SCHOOL FRENCH. I don't speak German or Italian. And I speak just enough Spanish to get by on vacation in Mexico. So perhaps it was wishful thinking on my part to assume that IT was a universal language and that it would be easy to blend the skills of IT staffs from seven countries.

What was I thinking?

When I became CIO for U.S. Can in late 2000, I walked into a number of challenges and really didn't give our people across the pond much thought. My first impression of U.S. Can's European IT managers, who are based in the United Kingdom, was that they had fancy PowerPoint presentations and fancier visions for IT. And I noticed that they spelled everything with s's instead of z's.

They were very proper and had immense disdain for our old AS/400-based systems. They had dreams of RFIDs on each and every one of the 2 billion cans we make annually. It seemed like they were flying, and we were crawling.

Some of the U.S. staffers had a pretty negative attitude toward their IT brethren in Europe. All that really linked us was a Sprint WAN. We had no other systems in common—not even e-mail.



One day, not more than two months into my new gig, our ISP went bankrupt, shut its doors and cut off service with no notice. We were dead in the water. My first thought was to call Sprint and ask them to be our ISP. But there was only so much Sprint could do immediately. While we were in the weeping and gnashing of teeth stage, we vented to the only other people who could identify with our pain: our European IT. While I was running around soothing the fears of the executive management team, my network guy and their network guy started talking, and they figured out that we could bounce data across Sprint's WAN and use the European ISP as a backup. Within a day, we were back up. Slow, but up. Our data was flowing, and the ancient e-mail system was working again. All of a sudden, these two IT shops were joined at the hip, bonded through crisis.

This initial encounter prompted us to start sharing. There was no plan for any sort of corporate globalization; we were

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just a group of kindred spirits who found commonality in our business challenges.

Even so, the language barrier between our English and theirs, especially those with a Welsh accent, was huge. The most common phrase heard was, "What did you say?" We finally

multiple pints of ale.)

Even before I approached the CEO about formalizing this arrangement, it seemed like a good idea to review all aspects of our operations and look for other synergies. As it turned out, there were people in the United Kingdom who had skills and experience we didn't have on our U.S. team and visa versa. At that time, my U.S. technical support team needed an experienced manager, and we didn't have the budget. I repositioned the lead person in the United Kingdom to fill that spot and help us define a global strategy.

On a more strategic scale, we built a three-year global IT plan to support U.S. Can's business objectives.

It is architected to support a single

set of standards and includes a long-range plan to move to a single platform. With buy-in from IT teams on both sides of the Atlantic, I went to the CEO and the CFO with the concept of a global IT group. The idea was embraced, and we were launched.

Going Global

During the past two years, we have reduced our costs by about 10 percent annually in real dollars. Here are some specific examples of what we have achieved:

- A common infrastructure: global e-mail system, and Token Ring to Ethernet conversion in United States.
- Joint projects and joint project teams: active directory and firewalls.
- Best practice sharing: applications, standards and processes.
- Global contracts and cost savings: We can manage vendors on a global basis.
- Around-the-clock coverage and backup.
- Fill-in resources for each other—both strategic and tactical.
- A sincere appreciation for each other's cultures.

It's probably worth mentioning that one of the side benefits of this arrangement is travel. I've visited our plants in Merthyr Tydfil, Wales, Erftstadt, Germany, and Reus, Spain. Along the way, I've driven (slowly) by Windsor Castle and through Catherine Zeta-Jones's hometown. And now other functions such as sales, HR and finance have started working more closely together with their European counterparts, sharing expertise and information.

It really *is* a small world after all. **CIO**

Sheleen Quish is global CIO and corporate vice president of marketing for U.S. Can. She can be reached at squish@uscanco.com.



It was wishful thinking on my part to assume that IT was a universal language and that it would be easy to blend the skills of IT staffs from seven countries. Guess again. Even the language barrier between our English and our British colleagues' English was huge.

began using videoconferencing to read facial expressions and body language. Because of the time difference, when our meetings started we were on our second cup of coffee and the European staffers were thinking about stopping at the pub on their way home.

Replacing the company's e-mail system in the United States was the first project we tackled. The U.S. group was leaning toward Lotus Notes because it ran on the AS/400, while the European operation had the Microsoft Outlook/Exchange combination. Since we already had the Microsoft Office suite on our U.S. desktops, and e-mail was included in the Microsoft licenses, it seemed to me a no-brainer to select Outlook/Exchange. It saved money, we had in-house support in Europe, and it was a huge step toward globalization. (Or is it globalisation?)

Then the European team lost its executive sponsor. They were leaderless. As the CIO, it made sense for me to step up and offer to manage all the IT resources in the company.

The Pub Tour

But first, my CEO decided it was time for me to meet some key folks in Europe. I had never been abroad and didn't even have a passport (never mind the appropriate adapters for my curling iron!). Finally, everything came together and off I went to Cologne, Germany, London and Wales—all in a five-day period. I took lots of pictures, especially of the members of the IT team. I still have one on display in my office: our guys in the pub at lunch. The pub was a tiny place in Wales, warmed by a coal fire just as it had been in the 16th century. (And we think colonial is old.)

The trip was a success. Meeting the European team face-to-face really improved everyone's comfort level and generated confidence in the proposed new arrangement. (The beers didn't hurt either. Key criteria for a global CIO: Be capable of handling

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*Survey conducted by META Group; numbers represent clients who use both META Group and Gartner and who expressed a preference.

Michael Schrage | Making IT Work

It's All About the Execution

Time to Brand Your IT?

Conducting an exercise in branding could help you manage user expectations and improve your department's image

BUILDING A BRAND IS ONE of the darker business arts. Are brands more about making people *think thoughts* or *feel emotions*? Is the essence of a brand absolutely, positively captured by slogans like "It floats!" or "The Real Thing" or "You're in good hands"? Or do those tag lines merely exist to semantically reinforce what really expensive ad agencies like to call "the brand experience"?

Heck if I know. But I'm confident that the vast majority of CIOs don't bring much of a branding sensibility to the work they oversee. I asked one Fortune 100 CIO how he would describe his IT department's "brand" within the enterprise. He looked at me as if I were a moron—I know that look; I see it a lot—and sniffed, "You mean, what's our *reputation*?"

"No," I persisted. "If your IT shop were a firm within the firm, how would you describe the brand value of your group and what it delivers?" After a pregnant pause, he answered: "I would say that we are an agile, world-class CMM Level 4 IT function that is both responsive to and collaborative with our business partners in a timely, cost-effective and quality-oriented way." He said this with a straight face.



Now it was my turn to look at the CIO as if he were a moron. I had worked with this company. Let's just say the "brand experience" his internal clients described was something less than the breathtaking "brand value" he so eloquently promoted. Because I'm basically not a nice guy, I started asking other CIOs and IT executives this question. The answers—after the obligatory "You must be kidding" look—were either variations on this "mission statement" theme or simple statements about what they thought was their group's "core competence." This was true even for companies built on brand management, such as Procter & Gamble. The most impressive response was, "We're the best partner for data-driven business initiatives."

The Value of a Brand

Because I'm *really* not a nice guy, I also asked executives and midlevel managers at a variety of companies the obvious coun-

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terpart question: How would you describe the “brand value” or “unique selling proposition” positioning of your company’s IT department?

What Your Users Think of You

No one looked at me as if I were a moron this time. To the contrary, snorts, smirks or smiles prefaced every reply. “Our IT’s brand proposition?” said one HR executive. “It’s got to be, ‘We’re always looking for ways to outsource to India.’” Another was: “Gotta problem? That’s why we have the help desk. Call them.” Or how about, “You’re not just a partner; you’re a beta site” and “You bought it; you support it”? Several responses revolved around, “Yes, we can do that for you if you really want—but not at that budget and schedule.”

In other words, internal customers and clients tended to focus on promises unfulfilled or pathologies they disliked. To be

IT is under fire in global enterprises and for good reason. IT is alternately regarded as critical differentiator and costly commodity. CIOs could do far worse than go through the disciplined exercise of submitting their strategic and operational aspirations to the rigors of a branding methodology.

fair, almost every internal customer in my unscientific sample acknowledged what their IT departments were *trying* to accomplish. But they chose to focus on describing their *actual* experiences as the brand value. Of course, none of these IT departments actually had an internal “brand manager” or brand-building campaign. Which begs the obvious questions: Should CIOs think of their operations as an exercise in building a brand? What if a CIO had a brand manager responsible for internal promotion of the IT brand within the company? If a CIO hired an ad agency to come in and create an advertising and promotional campaign within the company, what would that campaign look like? What might it promise? Who would be the key targets? How would success be measured?

How to Change a Bad Rep

These questions may seem rhetorical, but they aren’t. IT is under fire in global enterprises and for good reason. IT’s value within the organization seemingly oscillates between strategic

opportunism and necessary evil. IT is alternately regarded as critical differentiator and costly commodity. CIOs could do far worse than go through the disciplined exercise of submitting their strategic and operational aspirations to the rigors of a branding methodology.

I’m not for a moment suggesting that IT must be branded within the company or that a CIO would be wise to steal away a brand manager from P&G or Nike or Coca-Cola—or from his own company!—to bring a branding sensibility to the department. Even more important, I’m not saying that CIOs should behave as if IT needs to be internally branded.

Building a Brand

However, I’m completely comfortable asserting that a brand perspective can bring organizing—and reorganizing—principles to IT that could make it far easier to manage expectations

as well as implementations. Creating a brand for an ERP upgrade, for instance, might help anesthetize the pain of adjustment. After all, internal clients are consumers and users of IT goods and services. They see IT vendors conduct brand-building campaigns. Their expectations are being dynamically influenced by what they see in the press and on the Net.

Indeed, every individual a CIO deals with inside the company and out has been a target of a branding campaign. People are used to seeing and experiencing advertising, marketing and promotional campaigns. They’ve been—we’ve been—conditioned accordingly. Doesn’t it seem odd that we

run our internal IT operations in a way that effectively ignores this reality? Isn’t it ironic that some of the most gifted and expert branding organizations in the world seemingly ignore that expertise in their own internal organization?

In the same way CIOs are wise to imagine what they would do if the departmental budget was cut another 25 percent or increased by another 15 percent, they would learn an awful lot if they pictured their portfolio of services and deliverables in the brand context. Is IT a single brand? Or a family of related brands that should be appropriately segmented? Again, I haven’t a clue.

But I do know that the ability to build a positive brand identity within the company would lead to new and improved information technology. **CIO**

Michael Schrage is codirector of the MIT Media Lab’s eMarkets Initiative. He can be reached at schrage@media.mit.edu. Please send your comments to us via e-mail at letters@cio.com.



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BY BEN WORTHEN

For the better part of three days

last June, Bill McDermott, president and CEO of SAP America, sat at the head of an oversized conference table in an out-of-the-way third-floor meeting room in the Orange County Convention Center in Orlando, Fla. CIOs and other executives from some of the country's leading companies attending the software giant's annual Sapphire trade show paraded in and out, happy for face time with the head of the company to which most have either given or are about to give millions of dollars. In a meeting with a *CIO* reporter, McDermott stares out the tinted glass wall overlooking the bustling convention floor and then dives into the same pitch he gives the pilgrimaging executives.

"You have ERP," says SAP's CEO. "The next step is to expand it to CRM and the supply chain." The idea, he says, is to control all the data in a company by standardizing on one system for the front end and using one data source for the back. His pitch reaches its climax when McDermott sounds the message SAP has been trumpeting all week:

It's time to move to a single instance.

In other words, McDermott is telling CIOs to forget the multiple systems their companies use today, rip them out, and replace them with one ERP system—with one data store—that serves the entire company, no matter how diversified or geographically spread out it is. That, he says, is how to get the most bang for your IT buck.

Reader ROI

- ▶ Why single-instance ERP is now feasible
- ▶ What business drivers should factor into your decision
- ▶ How companies are determining their integration strategies



Rock-Tenn CIO Larry Shutzberg says ERP vendors selling single instance have been "pounding down my door." But he believes his business is too specialized for one ERP system and that Web services is too immature. Consequently, he's in waiting mode.

"I hear it all the time," says Larry Shutzberg, CIO of Rock-Tenn, a \$1.4 billion packaging manufacturer. "The vendors are pounding down my door."

By now, most companies—especially those in the \$1 billion to \$5 billion range—have heard the knocking. And so far, they seem to be listening. In a recent study on the government's new financial reporting requirements, AMR Research found that 65 percent of the companies it interviewed were considering ERP consolidation, a percentage that analyst Bill Swanton thinks is representative of the market as a whole.

"Only a small percent of companies did single instance the first time [they implemented an ERP system], maybe 10 percent," Swanton says. "Easily 50 percent of the rest are considering it over the next two years."

THE SIREN SONG OF SINGLE INSTANCE

What deploying a single instance boils down to is getting rid of your existing ERP and other best-of-breed systems—such as purchasing and CRM—and replacing them

with a single monolithic system from a single vendor. Everything your company needs—financials, order entry, supply chain, CRM—would come from SAP, Oracle, PeopleSoft, whomever. There would be one giant database, one application that does everything.

And there are some compelling reasons to undertake such a project now. For starters, the Sarbanes-Oxley Act, the government's post-Enron accounting legislation, requires that financial reports have a verifiable audit trail. (For more on Sarbanes-Oxley, see "Your Risks and Responsibilities" at www.cio.com/printlinks.) With a single instance, all of a



By moving to a single instance, ViewSonic VP for IS Robert Moon says he has decommissioned a million dollars' worth of hardware and cut his annual maintenance fees by \$150,000.

PHOTO BY MARK ROBERT HALPER

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company's financial data will live in one application and will originate from one source, eliminating consolidation errors and greatly reducing the time it takes to close the books.

Having a single data source could also create new revenue opportunities and cut costs. Companies would be able to run reports that show cross-promotion opportunities, places where they could reuse equipment or leverage purchasing power. Also, AMR estimates that companies budget \$4.3 million for a single-instance order management module versus \$7.1 million for multiple instances.

But despite these benefits, rip-and-replace is a difficult pill for CIOs to swallow, many of whom are just shaking off the multiyear, multimillion-dollar hangover of their first ERP project. And they're wondering if there isn't another cure for their integration headaches: Web services, those plucky little XML-based applications that are currently being held up by multiple standards organizations often working at cross-purposes (see "The Battle for Web Services," www.cio.com/printlinks). Web services could allow CIOs who have invested in best-of-breed solutions to integrate their standalone systems without either shelling out millions for single instance or tying their company's future to a single vendor.

Essentially, single instance and Web services are two ways to get to the same place, and CIOs will need to choose which path to lead their company down.

"There's no right answer," says Shutzberg. "Every situation is different. You have to follow your specific business drivers until you find a compelling reason to do it one way or the other."

HAVEN'T WE HEARD ALL THIS BEFORE?

Does McDermott's pitch sound familiar? It should. After all, ERP vendors today are singing the same song that got them through the corporate door in the first place: one system for everything (see "Sometimes a Great Notion," below). But as almost everyone who tried to do an ERP project in the mid- and late '90s learned firsthand, the melody was off-key.

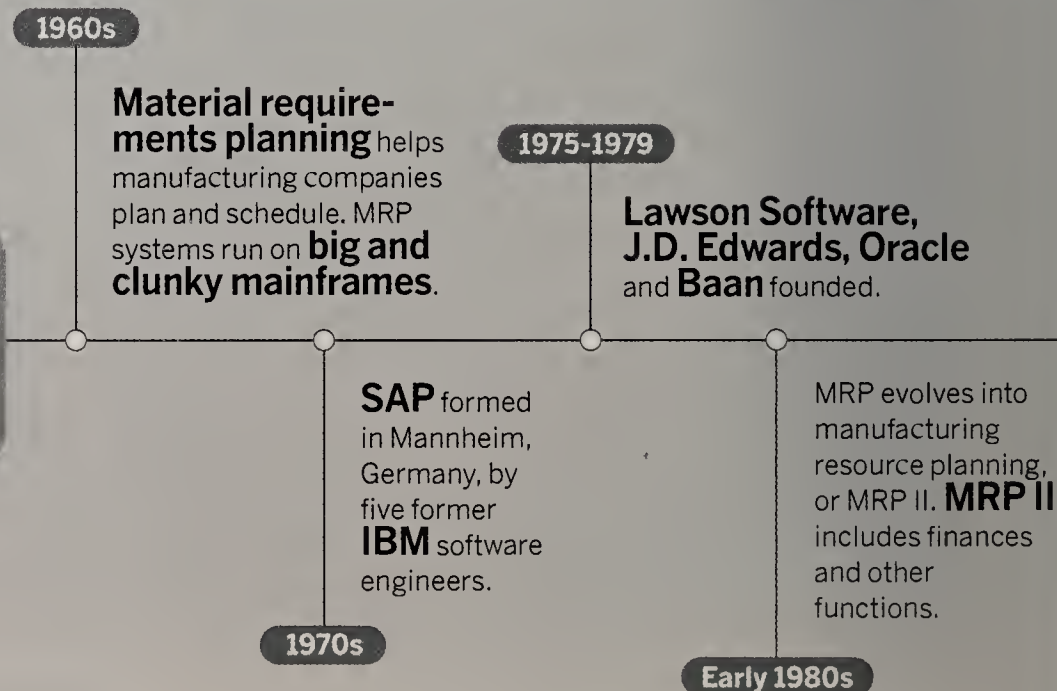
There are a couple of reasons single instance was almost impossible to achieve. For starters, databases large enough to serve entire enterprises just didn't exist—at least not at prices most could afford. On top of that, connecting to that single database from faraway locations was almost impossible. It was a simple matter of physics, says Cap Gemini Ernst & Young Chief Technologist for the Americas John Parkinson. There wasn't enough bandwidth to get to the data. "The result was a bottleneck," he says, which forced geographically dispersed companies to install regional ERP systems.

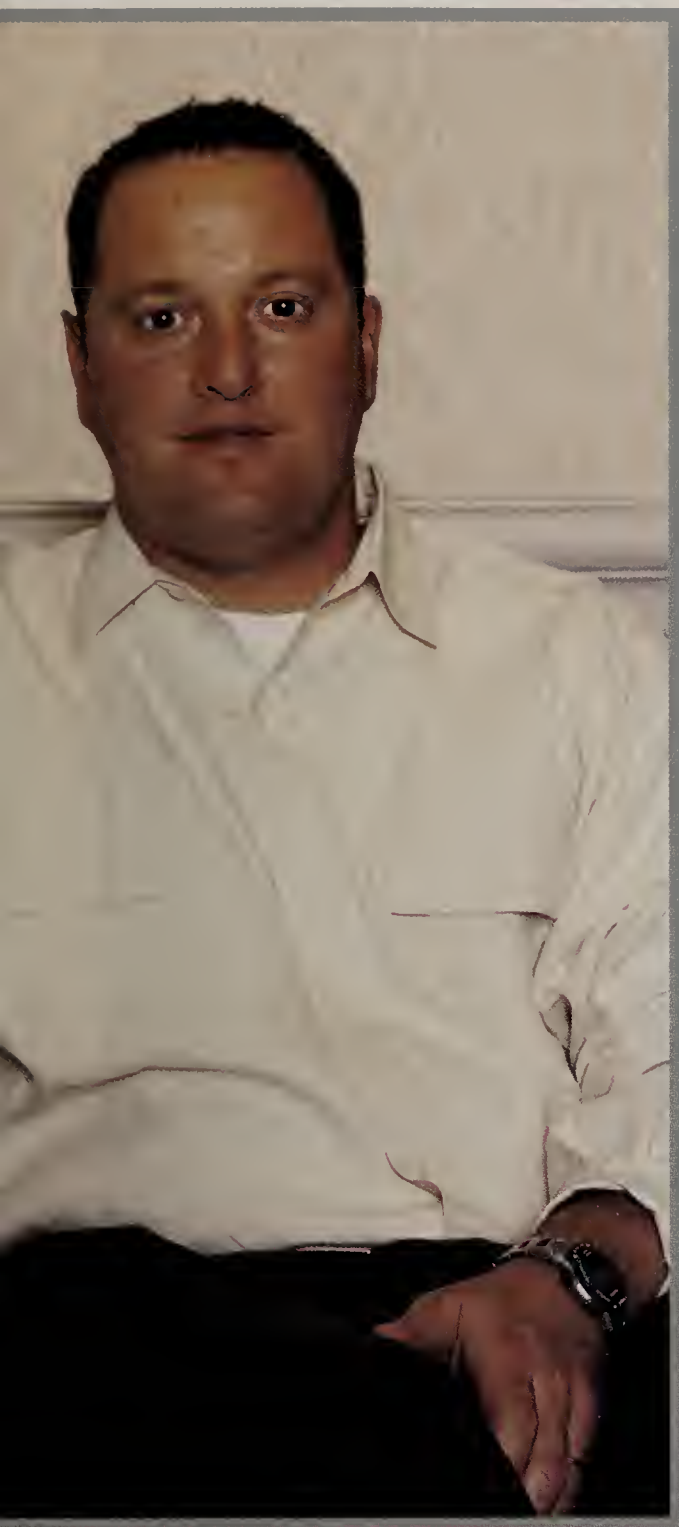


Holly CIO Tommy Guercio is resisting single instance because "if we wanted the full benefit, we would have had to buy their financials, purchasing and billing as well. We couldn't have gone in and just done the areas that we needed."

Sometimes a Great Notion

Wherein we track the **rise** and **fall** and **rise** of ERP





Those ur-ERP projects weren't just victims of immature or inadequate technology; they were also sabotaged by bad timing. The primary driver for the ERP projects of the '90s was Y2K. Companies rushed into the projects so that they could remediate old systems before the date change reduced them to rubble. But as the millennial deadline approached, CIOs had to reduce the scope of their projects to get them done on time. What suffered was process change—getting everyone to work the same way.

“Rather than resolve the ways different operating units worked, they threw in a system in France, one in the U.K., and one in North America,” says AMR’s Swanton. Each of those systems wound up customized, which meant that they couldn’t interact without an integration layer, which most people didn’t bother with. Consequently, each system ended up a separate instance. The result, according to a 2003 Hackett Group survey, is that the average company now has 2.7 ERP systems. Some have more, such as \$1.1 billion Esselte, an office-supply company, which has 22. (Esselte is currently trying to move to a single instance.)

But a single instance is now more realistic than it was in the past. Storage is much cheaper than it was five years ago and, thanks to the evolution of the Internet, connecting, even across oceans, is no longer a

significant problem. Furthermore, there’s no longer a Y2K hovering overhead like a sword of Damocles. There have been other advances too. For example, ERP vendors offer modules, such as supply chain or product lifecycle management, that they didn’t for most of the '90s, and other modules have been improved.

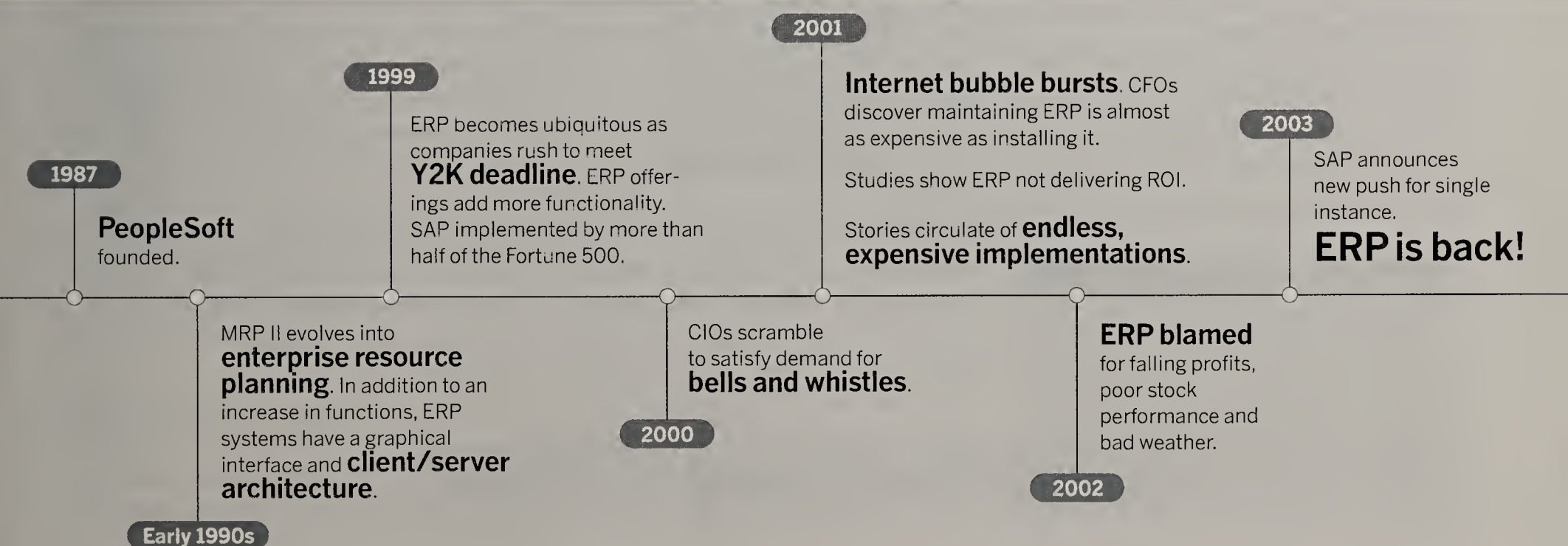
Of course, it all takes time and money. AMR predicts that moving to a single instance will cost companies \$7 million to \$12 million for every billion of revenue, and that projects will still take from one to three years. But experts, analysts, consultants and CIOs all agree: Single instance is finally doable.

WHO'S DOING WHAT AND WHY

No one does an IT project just for the sake of doing it, especially not in this economy. For a company to undertake a single-instance project, there has to be a compelling reason. The CIOs interviewed for this story named three: financial reporting, cost control and competitive advantage.

Financial reporting. Esselte has three divisions and operations in 120 countries. It has 22 ERP systems. Until now, the business units were encouraged to be independent even though they sell the same products

PHOTO BY NANCY NEWBERRY



that, for the most part, come from the same factories. Consequently, it has been impossible to make sense of the information coming from the various systems, says CIO Lani Spund, because they use different terminology for the same things. "We couldn't get consistent information," he says. "It's not that the information wasn't good; it was that we didn't *know* if it was good or not. We couldn't trust it."

Currently, it takes weeks for Esselte to close its books. It also takes an army of expensive accountants, climbing mountains of spreadsheets, to reconcile all the different terms. In order to get things under control, Spund is in the process of replacing 18 of the 22 systems with a single instance, Microsoft's Axapta (the remaining four have been consolidated into a single SAP system, which Esselte will retain for the foreseeable future). In four years, when all the old systems have been replaced, says Spund, Esselte will be able to record transactions in the general ledger as they happen. It will, he predicts, let them close their books within days at the end of a quarter.

Total cost of ownership. Multiple ERP instances and multiple data stores require multiple support teams. Each best-of-breed point application also has to have its own support group, user training and, in most cases, hardware. Getting rid of those costs was the primary reason that ViewSonic, a \$1 billion manufacturer of plasma TVs and LCD computer monitors, replaced its three ERP instances with one.

In 1997, ViewSonic deployed Oracle ERP systems in the Asia-Pacific region; Europe, the Middle East and Africa; and the Americas. Each had its own data store and used different operating systems, says Vice Presi-

A Cautionary Note on Web Services

Whether you take the plunge or wait for standards to emerge, the costs and risks will be the same

Most integration efforts today don't employ Web services. Rather, they work with more established XML-based messaging middleware, such as MQSeries and ActiveWorks. But there is general agreement among experts that Web services is a viable long-term integration answer. In fact, Web services is already popping up in some companies, inside the corporate firewall. But Cap Gemini Ernst & Young Chief Technologist for the Americas John Parkinson says that these projects to date have mainly been small pilot-type projects, and that while they were challenging, they were nowhere near as challenging as integrating core applications is going to be. "People have an overly optimistic view of Web services," he says. "Companies are underestimating how complicated it's going to be."

Companies that start a Web services-based integration effort today are assuming more risks (see "Calculated Risks," www.cio.com/printlinks). They're basically coming up with an idea of what they think a Web services architecture will look like in two to three years and aiming for it, says Parkinson. If they miss their guess, they may have to do it all over again if they can't make changes to what they've developed.

The alternative is to wait for standards and best practices to emerge. By waiting, the project will be cheaper and follow a more prescribed path. But you may miss out on a couple years of benefits.

Parkinson expects that the ROI on both approaches will ultimately be the same, with the quicker return of the latter (waiting) making up for the increased cost of the former (taking the plunge). The bill for both, he believes, could be similar to a single-instance ERP project.

-B.W.

dent for Information Services Robert Moon. There were more than 500 customizations among them. In other words, while they were all Oracle, they functioned as three entirely independent systems.

"It was causing huge problems," says Moon, not the least of which was that ViewSonic was writing three separate and large support checks. In May 2001, the company began replacing the old systems with a new single instance of Oracle (it was cheaper to stay with Oracle since Moon was already paying for the licenses, which never expire).

To date, Moon reports that he has decommissioned a million dollars' worth of hardware and cut his annual maintenance fees by \$150,000. He's also reduced his

Oracle support staff from 26 full-time employees to nine. None of these savings, he says, would have been possible without consolidating on one system, and ViewSonic has become an Oracle reference customer.

Competitive advantage. Up until last year, Ensco International, a \$700 million offshore oil drilling company with 56 rigs and offices around the globe, had separate best-of-breed applications for each functional area, like finance and purchasing. And each rig had its own customized parts and maintenance databases.

"If we were notified by a vendor that there was a problem with a particular type of valve," says Tom Chapman, Ensco's director of IT, "we would have to e-mail each rig and

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Is an über-ERP system the way to go?

Single-instance ERP may mean savings and efficiency, but the rip-and-replace it entails means heartache and anxiety. Could you get better results with Web services? Tell us what you think in the **ADD A COMMENT** box at the end of the online version of this story.

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ask, 'Do you have this valve? And, oh, by the way, have you had a problem with it?'" The information was out there, but it was trapped in each rig's system, and in each rig's proprietary data format.

Ensco's single instance of PeopleSoft went live in the first quarter of 2003 for all its offices and rigs, and now all its inventory information is in one place. If a rig off of Venezuela needs a particular piece of equipment, instead of buying it from a supplier, Ensco can check to see if another rig has it sitting in inventory. The single instance allows Ensco to visualize its purchasing habits and hence maximize its purchasing power. In fact, the company can now run reports on anything it likes.

One area that is particularly useful, says Chapman, is analyzing maintenance trends. Each rig is essentially just millions of pieces of equipment thrown together. "The amount our customers pay us on a daily basis doesn't allow for too many failures," says Chapman. By doing a detailed analysis of all of its equipment, Ensco can figure out the optimal time for preventative maintenance,

Single Instance	VS	Web Services
You should consider single instance if you... » Have fairly commonplace business processes that extend across all divisions » Have older systems that need to be replaced » Have multiple ERP instances from a single vendor		You should consider Web services if you... » Have divisions with unique business processes that can't be changed » Consider an existing investment in best-of-breed solutions a competitive advantage » Want an environment in which it is easy to integrate new applications

reducing both downtime and equipment failures. Chapman believes that this translates into a competitive advantage.

WHY THEY'RE WAITING FOR WEB SERVICES

Proponents of the single-instance approach, everyone from CIOs to vendors, recognize that what they're gaining in integration they are sacrificing in functionality. An inventory module from an ERP vendor simply won't have all the features

that one from a vendor of inventory software will. For Chapman, it was an easy sacrifice to make; he says that Ensco's point applications weren't that good to begin with. But for other CIOs, that may not be the case. For them, cost, functionality and the ability to collaborate with partners dictate that either they integrate their existing systems using today's XML-based integration tools or they wait until Web services matures.

Costs. Many companies have made substantial investments in best-of-breed software that they don't want to write off. When, for example, big oil companies were first moving to ERP packages in the late '80s, Holly, a \$1 billion oil refiner, looked at the big vendors before deciding to build its own ERP-like system for financials, called Trafx. Over the years, Trafx grew to include crude-oil purchasing, joint-interest and product billing, and project accounting, evolving to the point where it had one data store. But Trafx doesn't do everything the company needs—for example, asset management and enterprise reporting. "We looked at several ERP solutions, and they could perform all of the new functions we needed," says Holly CIO and Vice President of IT Tommy Guercio. "But the problem was that if we wanted the full benefit, we would have had to buy their financials, purchasing and billing as well. We couldn't have gone in and just done the areas that we needed."

To Guercio, replacing Trafx didn't make sense. It would have cost a bundle, and it would have been a tough sell internally—people don't want to go through the trauma of change when the current system is work-



Esselte CIO Lani Spund is in the process of replacing 18 of his company's 22 ERP systems with a single instance. Spund expects that system to allow Esselte to close its books in days rather than weeks.



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ing, he says. Instead, he decided to augment his existing system with best-of-breed solutions, which, he asserts, have more functionality than systems from ERP vendors. Guercio integrated the solutions using a variety of methods ranging from point-to-point to XML. This strategy has allowed him to preserve his company's core investment in its homegrown system.

Guercio says that Holly has had more success with the point integration than the XML, both because the company lacks familiarity with the newer technology and because XML tags generate a tremendous amount of data, which slows down overall performance.

Eventually, he believes, Web services could solve that problem.

Functionality. For some companies, a single ERP system is simply too generic to fit diverse or highly specialized business needs. For example, one Rock-Tenn division makes cardboard supermarket display boxes for products such as batteries and toothpaste. This unit needs to track the location, inventory level, lot number and expiration date of the products that will ultimately fill the displays, as well as the customer location and shipping date of finished displays—all in case of a product recall. Another division makes 2-ton cardboard rolls. Rock-Tenn needs to track each roll's weight, width and dimensions in linear feet and square feet. "There is no ERP system that does that," says CIO Shutzberg.

For Rock-Tenn, "trying to adapt an ERP system to fit our business process is stupid," he says. "And customizing ERP is even more stupid." Instead, the company has had to find the best ERP-type solution for each of its six business units. Shutzberg is in the middle of a two-to-three-year project to integrate each unit's system.

"It's no panacea," he admits, but it's the best solution available to him. Besides, the systems that each business unit now has work, and, he says, "the worst thing to do is throw away what's working in order to get to the end-of-the-rainbow utopia."

Today, Rock-Tenn's integration is largely application to application, although there are some Web services at the middleware level. That's the plan for the short-term future as well; Shutzberg says that there hasn't been enough development within the Web services community to convince him that Web services integration will be practical in the next year or two. "I like the concept," he says, "but I have to wait and see it mature."

Collaboration. A third reason that companies are banking on Web services rather than choosing a single-instance option is that Web services would allow them to connect

integration layer built with XML-based messaging queries is immune to that problem.

WHAT'S BEST FOR YOU

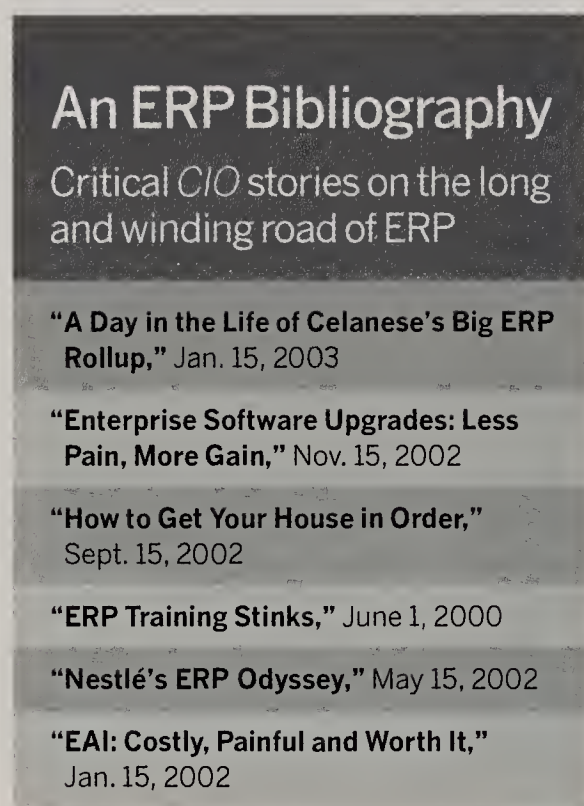
There are no rules for which approach to integration companies should take. There are, however, some trends.

Companies with fairly straightforward business processes without a lot of specialization are good candidates for a single-instance project. So are companies that don't consider themselves IT leaders—maintaining best-of-breed solutions takes more programming skills than doing a single-instance project.

On the flip side, companies that feel as though either best-of-breed applications or their programming skills give them a competitive advantage should consider going with (or waiting for) Web services. They should also consider going with Web services if they have business units whose processes would be difficult to conform to a traditional ERP system.

It's worth noting, however, that no matter what path a company takes, its CIO will most likely have to do a little of both. Andrew Macey, a vice president with IT services company Sapient, compares integrating best-of-breed applications to cleaning out a closet; it's an opportunity to decide which applications to keep and which to get rid of. Similarly, it's unrealistic to imagine that you will be able to rely on a single ERP instance for every business need. In fact, most ERP vendors partner with smaller specialty vendors for such tasks as tax calculation. "You are going to wind up with some integration chores no matter which path you go down," says Macey.

Web services-based integration and single instance are comparably sized projects. Each will cost millions of dollars and take at least a year. The nature of your business will determine which one you choose. "There are pros and cons to both paths," says Macey. "There's no easy answer." **CIO**



with business partners regardless of the partners' ERP system. That's the case for \$37 billion British American Tobacco. "The same rules apply to [your partner's apps] as they do to your own," says Gabor Makkos, CIO of the company's Mexican division. "I don't have to ask my provider to change their app architecture, and I don't have to change mine to collaborate."

British American Tobacco's ERP is SAP R3, with best-of-breed applications for specific processes; integrating with it used to require point-to-point connections. That means that when something changed—a supplier's application or its CRM system—the whole integration had to be redone, says Makkos. An

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The Sting

ON A TYPICALLY STEAMY NEW DELHI DAY IN LATE AUGUST 2002, NENETTE DAY WALKED INTO THE ASHOKA, one of the city's best hotels, for a meeting with Shekhar Verma. Verma had been fired from his job at Geometric Software Solutions Ltd. (GSSL), an outsourcer based in Bombay. He claimed to have the source code for SolidWorks Plus's 3-D computer-aided design package, which GSSL was debugging. Verma had contacted a number of SolidWorks' competitors and offered to sell them the source code. Day, an American, had taken the bait and flown to New Delhi. After confirming that what Verma possessed was indeed SolidWorks' source code, Day began negotiating on price, eventually bargaining him down to \$200,000 for the code. The deal struck, Day got up and left the room. Then agents from India's Central Bureau of Intelligence (CBI) swept in and arrested Verma. Day was not arrested—she is actually a special agent from the FBI's Boston Cybercrime Unit and had gone undercover to work with the CBI on this case, the first undercover operation for the FBI in India.

The arrest led to the first prosecutorial filing for outsourcing-related intellectual property (IP) theft in India, in a case that may come to trial before year's end. Given that software outsourcing was a multibillion-dollar business in India last year, the trial will draw close scrutiny from both sides of the world. Sound like an open-and-shut case? Day herself is not nearly so

confident. "With no case precedents, the reality is we have no idea how this plays out under their law," she says. Day also says that Verma made two small mistakes (she declines to specify them) without which he could have already gotten off scot-free, and that after a full week in India working with the prosecutors this fall, Day still doesn't understand the applicability of at least one of the critical charges.

Intellectual property, if stolen, "is a genie that can't be put back in the bottle," says Day. Currently, she says, "there is really no law to protect American companies' intellectual property."

U.S. companies need to think seriously about what that means. Consulting company McKinsey estimates that by 2010, the U.S. IT industry will save \$390 billion through off-

Reader ROI

- ▶ Why nondisclosure laws won't protect your code overseas
- ▶ The evolving state of intellectual property case law in India
- ▶ How to write a safer offshore outsourcing contract

U.S. companies outsourcing their software development offshore can get stung by industrial espionage and poor intellectual property safeguards

BY MICHAEL FITZGERALD



Intellectual Property Protection

shore outsourcing of software development. But it also opens up new channels of industrial espionage in bitterly poor nations that often don't have laws protecting foreign companies and rarely enforce whatever laws may exist. India, obviously eager to protect its national income from outsourcing, is scrambling to demonstrate that it takes foreign intellectual property seriously. Some observers say that other countries vying for outsourcing dollars are even worse when it comes to providing legal protection for intellectual property. Court cases are still relatively hard to find, but that's about to change. Smart companies need to reexamine their outsourcing contracts and make sure they aren't at risk of becoming the test cases.

In the Jungle

IT WOULD BE WILDLY SPECULATIVE TO

suggest that the SolidWorks case will even slow the bullet train that is offshore outsourcing of software development. India's National Association of Software & Service Companies (Nasscom) alone expects its outsourcing business will surge more than 26 percent to 28 percent this year (38 percent worldwide for higher-level business process outsourcing, according to Gartner). India's IT sector exported \$10 billion worth of goods and services last year, and projects it will reach \$21 billion to \$24 billion in 2008. Meanwhile, Forrester Research estimates that in the next 12 years, 3.3 million IT jobs will leave the United States and go overseas. These trends won't reverse over one case of an employee gone bad. "This is dealing with a rogue employee who left and stole information. That happens everywhere," says William B. Bierce, partner in Bierce & Kenerson, a New York law firm specializing in outsourcing and international business law.

The key question, of course, is the real degree of risk U.S. companies face. If overseas IP theft court cases are hard to find, doesn't it stand to reason that CIOs and CSOs are doing a decent job of protecting corporate IP assets? Dean Davison, vice

president and director of outsourcing and service provider strategies at Meta Group, emphasizes that he almost never hears complaints about IP thefts, and in general doesn't hear horror stories about overseas outsourcing. On the other hand, Elliot Turrini, an attorney with McElroy, Deutsch & Mulvaney, sounds much more dire. "Intellectual property is a legal fiction we've created to ensure a return on investment and promote the arts and sciences," he says. In countries with less developed laws, Turrini says, "Basically you're wide open."

Anecdotal, there are additional examples of IP spats overseas. Davison does say he's aware of one case where a U.S. com-

pany outsourced product design to an Indian firm, which successfully completed the project, then turned around and used the code to create a version for the Indian market. The U.S. company didn't care because it had no interest in the Indian market. A third case is currently pending in India. Legato Systems, a maker of storage software, has alleged that eight of its former employees in India took some of its intellectual property with them when they went to a competitor. Legato declined to comment on the action publicly, though one of its officials, speaking as an individual, told an Australian publication in February that he would recommend against future offshoring

Nine Tips for Protecting IP Offshore

- 1 SEND PEOPLE TO INSPECT** the physical premises where the software will be written. Note whether buildings have basic security check-in procedures and the like. Find out what kind of access people have to key systems.
- 2 LOOK CLOSELY** at the way networks function, particularly if you plan to use virtual private networks. These are good for cross-facility communications, but make it easier for remote employees to work from home or on notebook computers, which can increase vulnerability.
- 3 PROTECT IMPORTANT INFORMATION**, like source code, with passwords and access codes, and make sure that those are not widely available, either in the United States or at the outsourcing location.
- 4 DEMAND THAT THE OUTSOURCER** has tight human resources screening. Look for employee retention figures, find out if competitors do business with the same outsourcer, and if so, ensure that there is no contact between teams.
- 5 KNOW WHAT RISKS** your own organization can take. Regulated industries such as health care and financial services need to keep closer controls over data and software development than, say, packaged goods companies.
- 6 WORK TO UNDERSTAND** the legal system and culture of both countries. Negotiate contracts that make the offshore company responsible for the actions of its employees.
- 7 BUDGET FOR GREATLY INCREASED** telecom costs, as well as for regular visits to the outsourcer.
- 8 MAKE SURE THAT ANY TEST DATA** being used does not expose real information traceable to real customers.
- 9 ALWAYS MAINTAIN AN ORIGINAL COPY** of source code. This step seems obvious, but in one Y2K outsourcing case, a company was unable to prove that a bug had been added to a program because it had not kept its source code.

—M.F.



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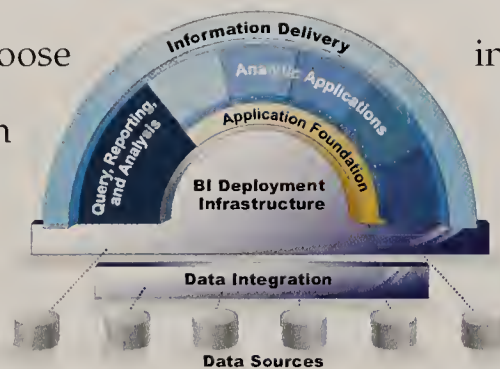
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in countries without better legal protections.

The irony: While these IP theft cases are from India, that country actually has a much *better* cultural and legal climate for IP protection than many other nations offering offshore coding. Observers say India has a culture that generally seems to respect intellectual property, as compared with China or Russia, for example—consider those nations' records regarding piracy of shrink-wrapped software and of copyrighted materials such as movies and music.

Indeed, Indian prosecutors in the SolidWorks case appear to have decided to charge Verma in part to establish firmer support for IP rights. India does not have laws against trade theft, so prosecutors filed charges against Verma under a general civil theft law, with a secondary charge of criminal breach of trust against his employer, GSSL. Another charge, pertaining to copyright law under India's recently enacted IT

India's reaction is already reassuring for U.S. companies. "Even if [the prosecutor] doesn't win, he's inspired fear," Bierce says. He also says that if prosecutors lose the case, they'll almost certainly complain that India's existing legal structures are not sufficient. He predicts that "some bright, young legislator will propose a new, more specific law."

The Finer Points of Law

PERHAPS. THEN AGAIN, IT MAY BE A long wait. Many observers still say too few U.S. companies worry about intellectual property theft when they send software development overseas, and that those that do fret nevertheless don't make sufficient efforts to protect themselves contractually. Why the Alfred E. Neuman-like serenity? In the case of India, which by some estimates

culture does not respect property, the courts are unlikely to enforce laws. Several sources interviewed for this article agreed, though not for attribution, that China regards intellectual property—especially that of foreigners—as communal property.

Despite its near miss on source code, SolidWorks has no plans to stop outsourcing to India. It won't even change business partners. It has worked closely with GSSL for more than six years, and has had the company do its debugging for the past five.

"It's been a very good relationship for us," says Holly Stratford, vice president and general counsel for SolidWorks. "We think it's very cost efficient, and it's a talented group of people. At times they've been almost a virtual office of ours."

Instead, both companies underwent intensive internal security analyses, Stratford says. "We obviously reviewed with them what their procedures were that made this possi-

India actually has a much *better* cultural and legal climate for IP protection than many other nations offering offshore coding.

Act, was added later. But despite being caught red-handed, Verma might well win his case. Because the source code didn't belong to GSSL, technically, Verma didn't steal from an Indian company. Thus India's laws don't necessarily apply. It's a frustrating situation for U.S. law enforcement officials. As Day says, "How can he steal something from GSSL when they don't own it? And when the nondisclosure breach of trust was signed between him and SolidWorks?"

Those are fine questions, and U.S. companies should look closely at the way the Indian courts and government respond to them.

Nondisclosure works well in the United States, which has laws like the Industrial Espionage Act of 1996, which makes it a criminal offense to steal trade secrets. But the law does not apply to non-U.S. citizens acting outside U.S. borders. Bierce, though, says

has about 90 percent of the market for offshore software outsourcing, it's largely because the country is a member of the World Trade Organization and adheres to its intellectual property add-on, Trips (Trade-Related Aspects of Intellectual Property Rights). In addition, several of the largest Indian outsourcing companies are incorporated in the United States and can be sued here. But Trips protections still must be enforced locally, and no countries prominent in software outsourcing have local laws covering theft of trade secrets.

"Complying with Trips is a starting point, but plenty of countries have signed Trips agreements. China is one of them, but there are plenty of examples of piracy or misappropriation of design by Chinese firms," says Michael Murphy, an attorney at Shaw Pittman. Trips signers or not, if a country's

ble, and they instituted a lot of revised procedures," most of which she won't disclose, though she does note that GSSL won't let employees take home source code to work on anymore. SolidWorks also has substantially changed its security procedures for U.S. workers, ranging from the way it handles access codes and office security to what it makes available on servers for remote workers. Stratford says this might create some inconvenience for employees, but they don't grumble much about it. She says the prompt response by the FBI and India's CBI quickly addressed SolidWorks' main concern, which was making sure it got its source code back. After the sting, all the copies of the source code were recovered from Verma's quarters. As for any strain in relations, Stratford says matter of factly that "the reality is, everybody has the same issue with their own

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Intellectual Property Protection

employees.” To her, a potential landmark case serves mostly as “a wake-up call.”

The truth is, SolidWorks got lucky. Verma allegedly contacted several competitors; only one of them told SolidWorks that its source code was up for sale.

Praba Manivasager, CEO of Renodis, an offshore advisory firm, says that he expects the Indian government to move quickly in passing stronger intellectual property laws, with the full support of Nasscom, India’s main software association and a powerhouse lobbyist in the country.

Manivasager notes that the Indian government is already working to change its traditional reputation of being guarded and difficult to work with, both because the country is competing with China for overseas investment and because existing busi-

Ken Pfeil, CSO at Capital IQ, says the SolidWorks theft case should ring alarm bells at every company that wants to outsource. “You really have to dig on due diligence,” he says. “[Require] background checks on employees, look at the company history and financial stability, look at their retention rates for employees.” Turrini, the lawyer, recommends putting someone with deep pockets on the hook. For instance, insist on indemnification agreements with the outsourcing provider, and make sure that provider has substantial assets in the United States just in case. Failing that, he recommends, get insurance for source code.

While those steps might sound straightforward, companies often fail to take even basic steps to check on potential suppliers, according to Bill Malik, who spent 11 years

overseas, such as databases and other packaged applications, they need to think about what kind of data they make available for testing. Also, Nasscom members are aggressively seeking out higher-end business process outsourcing (BPO) opportunities, such as call centers and claims processing. India outsourcing did more than \$1.2 billion in this type of work last year and expects to generate \$16 billion in revenue from BPO in 10 years. These kinds of applications create thorny issues about personal data protection for U.S.-based customers.

Legal eagles such as Bierce say that India and other nations interested in drawing more high-end software work such as BPO need to adopt laws that protect personal information when it’s transferred from other countries. “Software development is easy—

“People far too often don’t do their due diligence. I’ve seen organizations that just want to take a pass on the whole thing. They just want to outsource development to the cheapest vendor.”

—BILL MALIK, FORMER GARTNER ANALYST

ness investors were nervous about India’s near-war with Pakistan two years ago. “It’s actually overhauled a lot of international policies to help foreign investors come into India,” he says. “This case could serve as a landmark case, but it will most likely solidify what we are seeing, which is more and more support for international business. The Indian government has a lot to lose” if it doesn’t take the case seriously, he adds.

The Diligence That’s Due

LAWS OR NO LAWS, MANY BELIEVE IT would help if U.S. companies would treat offshore software outsourcing with greater care. Many companies looking to farm out their development work care only about dollar savings and can be sloppy about everything else.

as an analyst at Gartner before becoming CTO of Waveset Technologies. He declines to name names but says that “people far too often don’t do their due diligence. I’ve seen organizations that just want to take a pass on the whole thing. They just want to outsource development to the cheapest vendor.”

Usually, such hasty decisions are driven by the need to keep up profits and revenue. Looking at short-term financial gains is a huge mistake, Malik says, and cases like the one unfolding in India show why.

Also ahead: a shift in the outsourcing market that will put intellectual property protection in the spotlight. The first wave of software outsourcing has focused on application development and maintenance, both of which have fairly contained levels of risk, outside of the odd rogue employee like Verma. But as companies move more and more types of software development

you don’t have data protection problems until you start populating a database,” Bierce says. He notes that Nasscom is working on such a law, though it failed to generate one in a similar effort several years ago. The push for call centers, claims processing and other back-office work means that U.S. companies must reassess what’s at stake. As offshore vendors deal more and more often with customers and specific customer data, the potential for abuse rises. **CIO**

Michael Fitzgerald is a freelance writer based in California. Share your offshore outsourcing stories with Senior Writer Stephanie Overby at soverby@cio.com.

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TEXTRON's IT consolidation effort is a political and leadership challenge of global proportions. Can the company find the right mix after years of operating independently?

BY STEPHANIE OVERBY

LIKE MANY COMPANIES TODAY, TEXTRON IS UNDERTAKING A CONSOLIDATION.

And as with all such efforts, it is fraught with political risks and leadership challenges. But at Textron, a \$10.7 billion global enterprise with 41 business units under its roof, the difficulty of balancing the closer alignment of IT services systemwide with the disparate business needs is truly daunting.

Reader ROI

- ▶ How Textron is undertaking one of the world's largest IT consolidation efforts
- ▶ Why consolidation should be based on good governance, solid business relationships and zero tolerance
- ▶ How Textron is tackling the political and leadership challenges of centralization

The Providence, R.I.-based conglomerate is spending approximately \$320 million on its IT shared services organization, which it established at the start of 2002. Such centralization efforts are nothing new. For decades, the IT community has gone through waves of decentralization followed by centralization. Right now, *consolidation* is the buzzword. "Most companies are looking at this because, as a



PHOTO: ANDREW L. HARTEN

9 CIOs, 1 standard



“Without a good governance model, everything falls apart quickly. People need to understand their roles in the intended outcome.”

—Ken Bohlen, CIO, Textron

general statement, the more you centralize the more you can manage costs," says Michael Gerrard, vice president and chief of information technology management research at Gartner.

Textron is no different in its reasoning. But where Textron does diverge is in the scope. Founded in 1923, the company went on to become the first modern conglomerate, as founder Royal Little snatched up more than 70 discrete businesses, from aircraft and golf cart manufacturers to tool and fastener makers.

Today, each Textron company has its own IT management processes, pet applications, disparate technology standards and concerns about centralization. Nine business units have their own CIOs. And after years of operating independently, changing course is tricky. "To take this whole flotilla of ships and turn them all around so that we become a networked enterprise is something that's very difficult," says Phyllis Michaelides, chief technologist in charge of promoting technology standards. "It's not just about the number of data centers you have. It's a mind change."

Though it may seem counterintuitive to move away from having distributed IT to supporting diverse business units, Textron CIO Ken Bohlen says that his own research into IT best practices dictates otherwise. "All the data suggests that the way to the future is through common and standard processes," he says, adding that the new shared services department will take into account differing business needs. "The rule is start small, get successes and build in shared services only where appropriate," Bohlen explains. "There will be business-specific things that we won't touch. But the competitive advantage is not the systems you use but the agility and speed with which the business can implement the necessary technology to keep growing."

Thus, Textron's new shared services department is focused not so much on technology, but business alignment. The ultimate success or failure of consolidation hinges on putting three important pieces in place: good governance, solid relationships with the businesses, and leaders who support the vision. And that's exactly what the shared services organization spent its first year creating.

PREREQUISITE NO. 1 Good Governance

Solid IT governance—perhaps the most important factor in the success or failure of centralization efforts—was often lacking in previous consolidation attempts. For a consolidation effort the size of Textron's—in 2001, the company had 87 data centers, 1,314 servers, 1,540 applications, 11 CIOs and 55,000 end users—deciding how consolidation decisions should be made is often more important than the decisions themselves. This is because successful IT consoli-

Textron's Broad Reach

A multi-industry, multinational company headquartered in Providence, R.I., with business units in:

Aerospace (46 percent of revenue): Bell Helicopter, Cessna Aircraft

Industrial products (17 percent): E-Z-Go golf carts, Jacobsen

Fastening systems (16 percent): Textron Fastening Systems

Industrial components (15 percent): Fluid and Power Systems

Finance (6 percent): Textron Financial

dations must include the participation, and ultimate satisfaction, of the majority of IT constituents. Predictably, the biggest risk to successful consolidation is opposition from the business unit IT managers and users who are reluctant to give up control. "Without a good governance model, everything falls apart quickly," Bohlen says. "People need to understand their roles in the intended outcome."

Bohlen, who joined Textron in 1999, set up the Information Management (IM) Council at the beginning of 2002 when the IT shared services effort began in earnest. Populated by Bohlen, Michaelides and nine business unit CIOs, the IM Council is the top-level

guiding force behind consolidation efforts and meets on a monthly basis (face-to-face when budgets were plumper, and now via teleconference). "With a shared services effort, you have to make sure that IT and all the businesses are aligned," explains Bohlen, who headed up shared services departments previously as CIO at John Deere and AlliedSignal. "It's an almost daily initiative to keep everyone aware of and involved in what we're doing."

The first step for the group was goal-setting. Textron hired The Hackett Group, to deliver a baseline of reasonable IT spending for a centralized IT organization in a global, multi-industry company, and The Concours Group, to provide best practices for IT governance and project management. Every member of the IM Council is also working toward or has achieved Six Sigma green belt status, and the group employs Six Sigma Transformation Excellence processes, such as recording action items arrived at in each meeting, to guide its decisions.

The IM Council decided on some basic operating principles—for example, Textron IT shared services would operate on open standards. The group also created the concept of centers of excellence, which ensure that once a decision is made to implement a certain technology, it is implemented in the same manner across the enterprise.

The move resulted in additional assignments for once-siloed business unit CIOs. For instance, David Raspallo, CIO of Textron Financial, also took over as CIO of Textron's corporate center headquarters. Now Raspallo, in addition to reporting to the CEO of his business unit, reports to Textron CIO Bohlen. And the new reporting relationships extend throughout their organizations. Six of the IT employees on Raspallo's Textron Financial payroll now work for the HR center of excellence.

The matrixed teams ensure that the best talent is applied to each project, but it can get a bit confusing. "It's all new to us, and we're collectively stumbling our way through it," says Raspallo, noting that even with the solid governance practices in place, you "have to accept some of the ambiguity that goes along with this."

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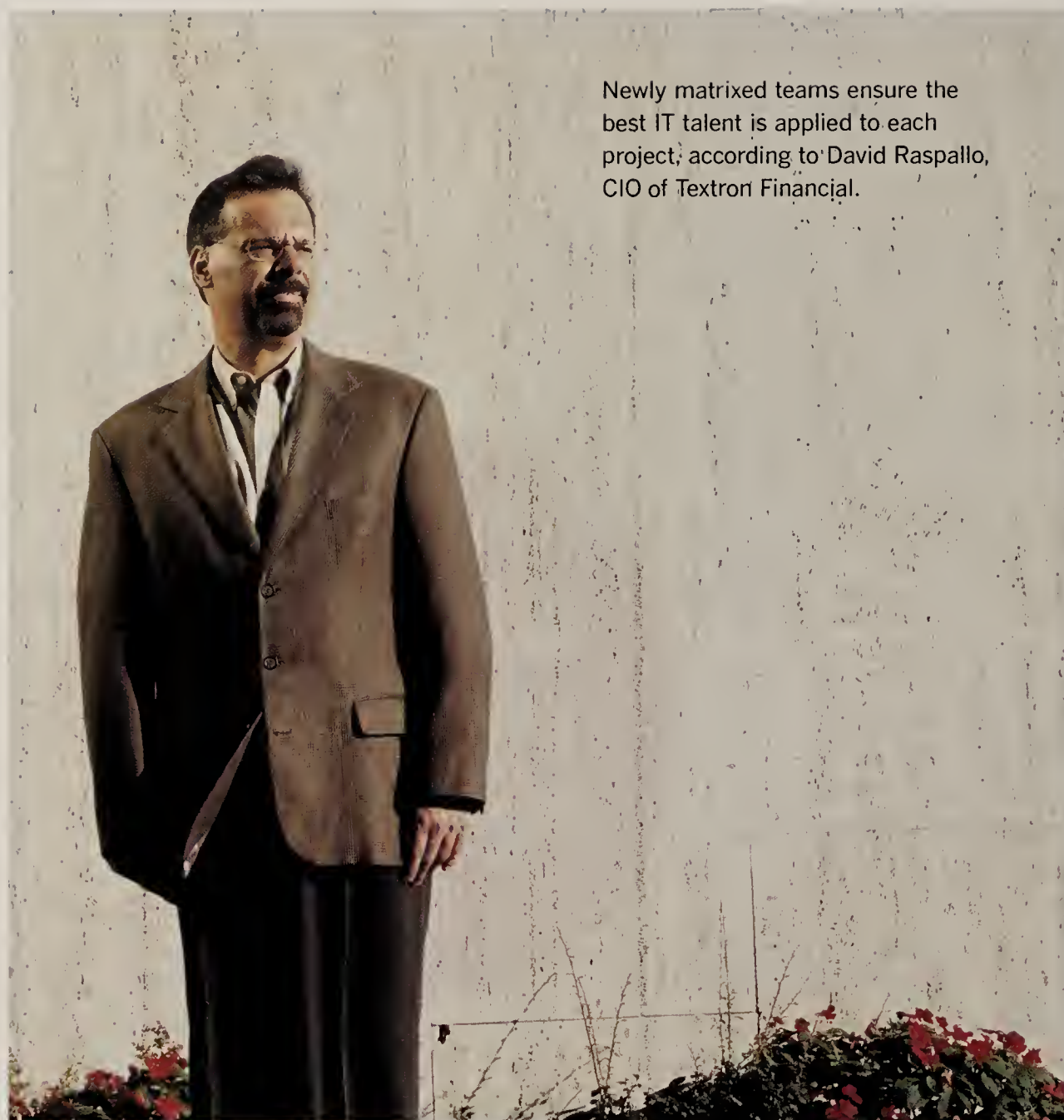
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Newly matrixed teams ensure the best IT talent is applied to each project, according to David Raspallo, CIO of Textron Financial.

Broader decisions must be made at the IM Council level, such as determining just how far Textron should go in its centralization efforts. Michaelides, who, like Bohlen, was previously at John Deere and AlliedSignal, has lived through waves of centralization and decentralization, and has seen such efforts go to extremes. "Here we're trying to find some middle ground, and it isn't easy," she says. In the IM Council, business unit CIOs had the chance to explain why, for example, some servers need to remain on factory floors. So although centralizing most data centers makes sense, Textron will never go to 100 percent data center centralization. Ultimately, the IM Council is aiming for "loose centralization," Michaelides says. "And maybe it will be a key differentiator for us that we recognize some of the intrinsic value of our diverse businesses."

PREREQUISITE NO. 2 Pressing the Flesh

Strong governance processes and cross-company teams to carry them out aren't enough. Relationship-building—with everyone from concerned IT employees to end users to the CFO of subsidiary E-Z-Go golf carts—ranks a close second in consequence. "You can-

not for one minute slack on the relationship side," says Bohlen.

Bohlen now spends about 65 percent of his time on building relationships with folks in IT and the business. Though high, it is just about par for the course when making a change of this magnitude. "When each of these businesses has to do its own P&L, it's only natural that they want control of everything," he says. "When you introduce shared services, you have to spend a lot of time relationship-building so they trust you. You can never do too much of this."

Within the scattered business unit IT departments, the concerns are no different than those that arise during an outsourcing arrangement: What does this mean for me and my job? With a very public staff reduction across the enterprise of 16 percent (9,500 workers) planned to happen by 2004 and Bohlen's recent hiring of a vice president of sourcing to look into offshore possibilities, IT workers have reason to be uneasy.

This summer, Bohlen went on one-day trips to each of Textron's businesses. He sat in on IT talent reviews and talked to those identified as "high potential" managers. He helmed selective "skip level" meetings with lower-level employees. He hosted town hall meetings with IT staffs.

The IM Council also set up subcommittees to investigate certain areas of consolidation on a more granular level, such as the security leadership team and the infrastructure leadership team. Like the IM Council, these groups are populated with IT representatives from each business unit and are subject to enterprise standards. They make recommendations, the IM Council debates them—and either supports the ideas or makes some changes—and goes forward.

At each level of IT governance, "some decisions are easier and some take forever," says Raspallo. One of the "easier" efforts was deciding on a common desktop system for the entire company.

In this case, members of the infrastructure team entered a conference room. "One person stands up and tells you why Dell's the best computer to buy. Someone else tells you why IBM is better," Raspallo says. But the new regime requires that team members leave that meeting with a compromise. In this case, the vendor of choice was IBM. The subcommittee presented its recommendation to CIO Bohlen, who then presented it to the IM Council. Once the decision was final, Bohlen required all business units to replace their desktops, as needed, with the new company standard.

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For his part, Raspallo meets weekly with the coordinators for each corporate center department, on a monthly basis with senior department managers, and on a quarterly basis with the entire corporate center. The meetings are necessary, Raspallo says, because of the amount of change users must absorb. And with a retention rate across the company of 96 percent during the past 10 years, says Raspallo (himself in his 19th year), more people are set in the old Textron ways than not.

PREREQUISITE NO. 3 Zero Tolerance

George Washington once said: "Government is not reason, it is not eloquence. It is force." At some level, Textron's IT consolidation is no different. Bohlen has made the participation of business unit CIOs paramount in his creation of the IM Council. And relationships are developing at all levels throughout the enterprise. But at a certain point, Bohlen believes, you have to eliminate detractors.

Chairman, President and CEO Lewis Campbell has put new CEOs at many of Textron's various business units during the past two years. The stakes are high. Campbell was recently quoted as saying that nearly 20 percent of the company's 150 executives (a group that includes Bohlen and Michaelides) are not performing well and may be laid off.

In certain cases, Bohlen has followed suit, placing new business unit CIOs in charge. "Take the new CEO at Bell Helicopter. As soon as he came over from Honeywell, we got together and made changes within Bell's IT department," says Bohlen. "In large organizations you will always have those people with differing opinions, which is good...until you have finally decided to do something. Then the time for debate is over."

It's no secret that ultimate compliance is what Bohlen and his boss, Campbell, expect. "By virtue of being on the IM Council, if you are part of deciding that something is right for Textron, that's what you're going to do," says Raspallo. "There is no tolerance for those people who nod their heads and say, I'm on board, and go back to their facility and do their own thing. You can't play that game, and if you do, you'll be the subject of a very public execution."

This is another area where Bohlen's efforts to get out into the busi-

ness units help him out. Visiting local sites and conducting meetings with lower-level IT employees who are actually working on the consolidation efforts give him clues about where leadership may be lacking. "I find the best data where the work is being done," Bohlen says. "They will tell you exactly what is happening and not happen-

Textron's IT Consolidation Goals

- >> Reduce data centers by 38 percent this year (down from original goal of 50 percent)
- >> Reduce servers by 50 percent by end of 2004
- >> Reduce infrastructure operations cost by 20 percent by end of this year
- >> Implement one e-mail system enterprisewide, cutting e-mail costs by 40 percent
- >> Reduce network costs by 25 percent by 2004
- >> Reduce contract costs by \$5.4 million
- >> Implement common management processes for infrastructure organization
- >> Dramatically improve communication to all constituents
- >> Create an application road map for all companies
- >> Create technology standards
- >> Implement additional centers of excellence and focus groups
- >> Measure customer satisfaction
- >> Implement new IT services in human resources, project management, mergers and acquisitions, finance, audit, disaster recovery and security
- >> Meet lower budget target (IT budget was cut 10 percent in 2002 and another 7 percent in 2003)

Read More on IT Consolidation

Companies consolidating IT and going from **decentralized to centralized** organizations face many challenges. Read about how telecommunications company Cingular went from having a mélange of call centers cobbled together through years of mergers to a consolidated system in **CALL TOGETHER NOW**. Go to www.cio.com/printlinks.

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ing." Bottom line, what Bohlen looks for is "a good attitude. It carries you a long way."

In some cases, Bohlen brings in one person from another company with a fresh perspective. In other cases, he's worked with employees to think about their jobs in a different way. If all else fails, he fires those who cannot work within the new shared services world.

It sounds a bit frightening, but Raspallo points out, "today's business environment is scary for CIOs both inside and outside of Textron. But if you perform, you are afforded an opportunity to look at either expanding your role in Textron or changing your assignment."

There's no special treatment for business unit CIOs who find this consolidation effort—and the amount of investment required to make it work—more of a challenge financially. Cessna Aircraft, struggling since 9/11, must make the same IT investments as business units in better financial shape. But by all accounts, they're making



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"To take this whole flotilla of ships and turn them all around so that we become a networked enterprise is something that's very difficult," says Phyllis Michaelides, chief technologist in charge of promoting technology standards.

ego aside to work for the common good," Raspallo says. "I have to just look at this as a new opportunity to contribute to an even bigger business."

The Road Ahead

With all the necessary pieces in place, significant changes are beginning to occur at Textron. Eighty-seven data centers have been reduced to fewer than 50, with the ultimate goal of six; 1,314 servers have been consolidated into 844, with the ideal being fewer than 200; and the company's 1,540 applications have been reduced to 1,400, with the ultimate goal of rolling out a handful of enterprise solutions. Just looking at the numbers, it's clear that there's a lot of work to do if Textron is to meet its 2004 goals. And the shared services team has had to make some adjustments to its original goals. The infrastructure team found that Textron had too many mail servers, creating concerns about the ability to communicate worldwide. So Bohlen had to divert some resources to remedy that situation, slowing the pace of data center consolidation.

Textron's IT leaders will tell you most of the really hard work has been done, and Bohlen says he plans to accelerate

them. "It's been a wonder," says Michaelides. "Companies like Cessna have just had to suck it up."

In other cases, business units that have grown through an acquisition may have many more systems to replace and consolidate than others, and therefore more money to convince their business unit boards to spend. But in the new Textron world order, everyone must make whatever investment is required to meet new standards. Once the decision was made to go to PeopleSoft as Textron's enterprisewide HR system (which IT executives will only say has been an eight-figure investment enterprisewide), for instance, the cost was relatively easy for Textron Financial CIO Raspallo to justify to his CEO. They were already running on PeopleSoft 7.5 and would simply upgrade to 8.3. It is a significant investment to be sure, but not as substantial as it will be for other business units with multiple or customized HR systems already in place.

Still the inherent lack of autonomy for business unit CIOs in the new environment is an adjustment. "I've been in the technology world for 23 years. I can be one of those individuals who goes up there and explains why product X is absolutely the best choice and collectively we decide to go another way. But I have to put my technical pride and

consolidation efforts during the next year. The good news is that the governance processes, the relationship-building and even the pressure to perform in the new environment are beginning to become second nature for Textron's IT leaders, which bodes well for the ultimate success of Textron shared services. "It's my job. It's what I do," says Raspallo, sitting in a conference room that used to be a redundant server room and marveling about the fact that his security key card now allows him to get on any floor at headquarters, not just those belonging to Textron Financial. "We used to talk about this transformation, these governing groups, Six Sigma, the IM Council, meetings—all the things we're doing to change Textron—as something *else* to do. Now it's *what* I do."

"We've made a lot of strides, and much of it has been structural," Michaelides says. "Structures had to be put in place peoplewise—the IM Council and subcommittees and centers of excellence and IT leaders and decision-making processes—before we went off chasing windmills. But now we have an organized pattern of bringing about the changes necessary for shared services." **CIO**

Contact Senior Writer Stephanie Overby at soverby@cio.com.

STRATEGIC DIRECTIONS

WHAT'S INSIDE:

THE METRICS & MEASUREMENTS HAVE COME OF AGE p.3

CRM STRATEGIES: WHAT WORKS, WHAT DOESN'T p.4

FRONT OFFICE AND BACK: THE OPERATIONAL SIDE OF CRM p.11

GETTING SMARTER ALL THE TIME: CRM ANALYTICS AND BUSINESS INTELLIGENCE p.12

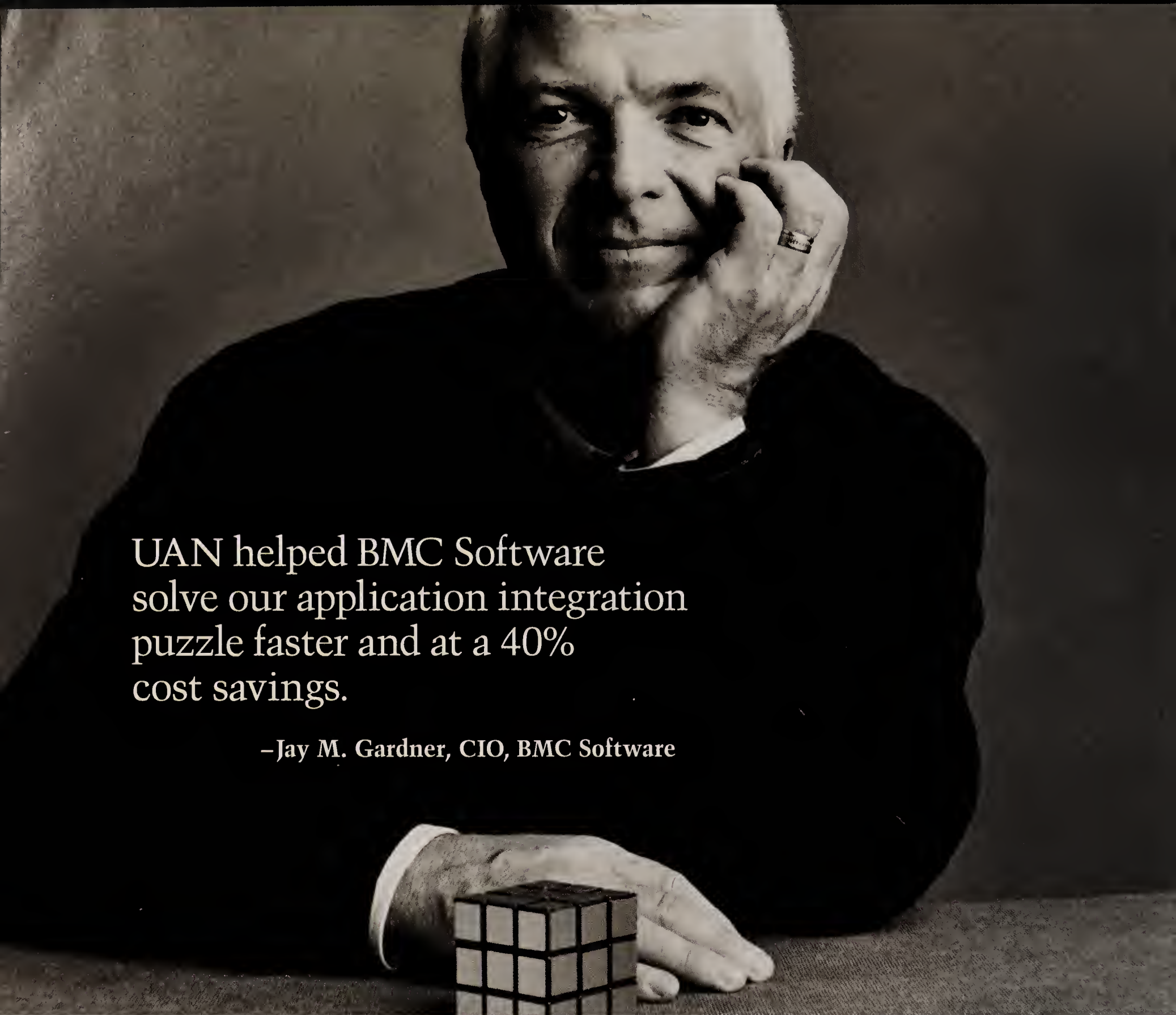
The ROI of CRM

STRATEGIES FOR MEASURING AND MAXIMIZING CUSTOMER RELATIONSHIPS

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—Jay M. Gardner, CIO, BMC Software

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CRM STRATEGIES: THE METRICS & MEASUREMENTS HAVE COME OF AGE

BY TOM FIELD

IT USED TO BE THAT A GOOD CRM strategy was a lot like former Supreme Court Justice Potter Stewart's 1964 opinion on obscenity: hard to define, but you knew one if you saw it. Trouble is, just a few short years ago it was tough to even see a truly good CRM strategy.

CRM projects? Yes, tons of them. Everybody in the late '90s had a CRM initiative. But metrics, results, ROI? Not so much.

Funny what an economic downturn will do, though. As IT budgets shrank and projects disappeared in the quagmire of the 2001 recession, the CRM imperative—the mandate to get closer and more responsive to customers—only grew, and with it emerged a whole new set of metrics, results and, yes, good CRM strategies.

That's what this edition of *Strategic Directions* is all about: The ROI of CRM—Strategies for Measuring and Maximizing Customer Relationships. What works and what doesn't? What's IT's role in a CRM strategy, and who actually "owns" the initiative? How do you pick a CRM vendor? Where do CRM analytics and business intelligence meet?

These are some of the questions tackled this issue, with answers and testimonials coming from the industry's leading CRM vendors and their customers. Real strategies, real results, real advice.

It strikes me that now is a critical

time for CRM initiatives. The new year is starting, the economy is turning around and enterprises are loosening their purse strings for new projects. It's an ideal time to start defining or refining a CRM strategy.

Maybe you're just warming up for a CRM project; maybe you've been burned before. Either way, this *Strategic Directions* has valuable information to help ensure that not only will you know a good CRM strategy when you see it—but you'll also be able to measure and maximize it.

in general, this edition in particular, and ideas you'd like us to tackle in future editions. Got any CRM best-practices you'd like to share with other IT/business leaders? Send them to me; I'll pass them along in our next issue.

Thanks for reading *Strategic Directions*. And thanks in advance for writing in with your feedback.

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**NOW IS A CRITICAL TIME FOR
CRM INITIATIVES... IT'S AN
IDEAL TIME TO START
DEFINING OR REFINING
A CRM STRATEGY.**

About *Strategic Directions*: As you know, *Strategic Directions* is the ongoing series of *CIO* Magazine supplements, produced by *CIO*'s Custom Publishing group, focusing on the key business-critical technologies and solutions of the day. Through research, analysis, case studies and vendor profiles, *Strategic Directions* provides an executive-level primer to the hot topics on the minds of senior IT and business leaders. Previous editions this year have focused on Outsourcing, Security and Storage.

Please let us know what you think —about *Strategic Directions*

**STRATEGIC DIRECTIONS
2004**

**For a preview of the
upcoming 2004 *Strategic
Directions* series, please
see page 11.**

CRM STRATEGIES: WHAT WORKS, WHAT DOESN'T

The Top Line is All About Customers, But the Bottom Line is About IT's Role in Obtaining and Retaining Them

JUST ASK THE FOLKS ON Wall Street: boosting the bottom line with cost savings and productivity improvements isn't enough these days—a necessary *but not sufficient* condition for competitive success. Now it's time to add topline revenues. And the top line is all about customers.

Customer relationship management (CRM) strategies and the technologies that enable them make it possible to figure out what customers want and the

customers, keep them longer and more effectively acquire new customers.

Despite widely circulated reports of CRM implementation failures, enterprises continue to invest in CRM technologies and solutions. Why? Because CRM-enabling technologies really can help enterprises to:

- **Develop a single view of customer data.** This way, regardless of touchpoint, every customer gets consistent information; duplication and redundancy is trimmed; customers aren't required to repeatedly feed in the same information about themselves to get

rationally and easily configured by sales staff.

- **Identify and target key customer groups.** Detailed knowledge about each customer can drive efforts to target their needs and spending capabilities; high-value customers can be identified and given priority.

- **Track and measure sales, customer service, and marketing performance.** Leads can be linked to the marketing campaigns that spawned them, so their effectiveness can be tracked; leads can be funneled more effectively to the most appropriate channel sales force; products and services for targeted customer groups can be developed in response to customer interest and demand.

- **Best practices can be identified and consistently implemented.** The most effective sales, service and marketing practices can be uniformly applied; sales logs can be automatically updated; repetitive, time-gobbling tasks—such as fulfilling requests for product literature—can be automated.

Evidence abounds that CRM implementations can succeed—and when they do, returns on CRM investment can be spectacular. Gartner, Inc., the Connecticut-based research/analysis firm, believes those organizations that devote at least 50 percent of their efforts to advanced customer-centric marketing processes will see a market-

CRM STRATEGIES AND THE TECHNOLOGIES THAT ENABLE THEM MAKE IT POSSIBLE TO FIGURE OUT WHAT CUSTOMERS WANT AND THE MOST PROFITABLE WAYS TO GIVE IT TO THEM.

most profitable ways to give it to them—important in an age when acquiring new customers is about five to 10 times the cost of retaining current ones.

CRM strategies are based on the premise that quick, accurate knowledge about customers empowers organizations to increase the value of current

service, which keeps them happier and improves sales and customer service staff productivity.

- **Provide realtime (or near-realtime) information.** So sales and customer service reps as well as customers can check product availability, order status, etc.; products and services can be more accu-

ing ROI by 2007 that's 30 percent greater than those who don't.

Consider the UK's Woolwich Independent Financial Advisory Services (WIFAS): its combined use of Oracle's Database, Warehouse Builder, Portal, Application Server and other products has generated \$23 million in cost savings and productivity gains, resulting in a 260 percent ROI. Its commitment to CRM has helped WIFAS grow by more than 250 percent in four years, as compared to a market average of 75 percent.

Yet, according to Gartner, as many as 85 percent of enterprises don't understand how CRM creates value in their customer bases, at least in part because their CRM implementations have been piecemeal and disjointed. What's missing is an enterprisewide CRM strategy that addresses these critical challenges:

- Supporting (and cost-justifying) an ever-widening range of marketing, sales and support activities while still presenting "one friendly face" to customers.
- Satisfying increasingly demanding customers—some of whom are much more valuable than others.
- Integrating information from a multiplicity of barely-coordinated data silos.

CREATING A CRM BUSINESS STRATEGY

How does your enterprise use its competencies to create value propositions for its customers? Which market sectors offer the most promise?

A CRM strategy—which lays out how that promise will be pursued—can't be formed without answers to these questions. And the strategy must be devised before plans for implementing the capabilities needed to achieve it can be completed. Steps along the way include:

WHO OWNS CRM?

Experienced IT groups have learned that CRM needs a business owner able to drive how the enterprise should develop and use it. CRM projects driven by IT alone are much more likely to fail.

CIOs need partners in the enterprise to make CRM successful. Best bet: cross-functional teams led by an influential skeptic and comprised of key stakeholders and those with appropriate skills. You'll need commitment from:

THE CFO. Without a convincing business case, the CFO won't fund your project.

CUSTOMER SERVICE. These folks know more about your organization's customers than anyone else. Listen to them as you design and build a CRM initiative.

MARKETING. Often tactical and product-oriented, insights about customers from marketing people can improve customer handling and campaigns.

Interdepartmental collaboration in areas where customer impact can be measured can help CRM managers launch cooperative projects that deliver tangible benefits.

Formalizing access to customer data, and rationalizing that data across all enterprise functions and departments, enables a cross-functional integration that can pay off big time. For instance, when database marketers collaborate with business unit managers, both will better appreciate the others' needs and abilities.

"IT is the only department that intersects with all parts of a company from a strategic perspective," says Michael Koval, vice president and CIO at real estate services provider Long & Foster. "With the correct players, IT can successfully implement the software. We can attest to that."

KNOW YOUR OBJECTIVES. The idea is to keep and acquire customers with the greatest value potential. By establishing objectives, one can determine specific, quantifiable customer acquisition, development and retention targets that meet corporate financial goals.

How this is best accomplished depends on the kind of organization and its priorities. Of course, customer retention is important to just about all organizations. Business-to-business enterprises aiming to become a preferred supplier often give high priority to customer development. Business-to-consumer enterprises with an eye to boosting market share concentrate on customer acquisition. Government and nonprofit organizations tend to care most about customer satisfaction.

KNOW THYSELF. Start by answering these questions:

- What are your enterprise's goals and imperatives?
- What should be achieved with a CRM initiative?
- What business units will be affected?
- What's the condition of the IT infrastructure? What needs to be upgraded, integrated?

TRANSFORM YOUR CUSTOMER BASE INTO AN ASSET. Be customer-centric. Focus objectives on your customer lifecycle, which then mirror your product/service lifecycle. This means:

- **Analyze your customers.** Look for ways that customer value is lost or unexploited. When you've spotted where action is required, you can set metrics and monitor them.

THE ROI OF CRM | STRATEGIES

■ **Jibe CRM and corporate strategies.** CRM strategy cannot stand alone; it must be derived from corporate goals and imperatives, and it must be linked to other operational strategies.

■ **Keep it flexible.** In a challenging, competitive environment unpredictably impacted by discontinuous change, CRM strategy needs to be dynamic and timely, adapting operational efforts and corporate direction to market conditions. Thus, successful CRM strategy evolves in an iterative process that takes advantage of customer and operational feedback to refine objectives, tactics and processes.

BUILD A REPEATABLE, CONTINUOUSLY IMPROVING PROCESS. The goal is to efficiently utilize all your organization's resources to present one friendly, consistent face to customers. Customers should get the same information about

CRM FOR THE ZERO-LATENCY, REALTIME ENTERPRISE

The ability to respond to events and conditions in realtime or near-realtime can provide substantial competitive advantage.

Faster response means business decisions are based on up-to-the-minute (realtime) information. Pulling it off requires integration of not just data and applications, but also key CRM, ERP and SCM processes so that decision makers have an accurate view of the organization's activities and capabilities. This means:

- Comparing actual process performance to key performance indicators that are based on organizational objectives and
- Balancing resource utilization against cost and revenue goals.

Such performance management (also called business activity monitoring) enables decision makers to consistently and continuously deploy resources and align processes to achieve strategic goals.

Singapore's OCBC Bank has achieved more than \$2.3 million in savings each year since implementing Siebel Finance in September 2000. The bank's successful CRM strategy has reduced insurance application processing time by 99 percent (from three days to one minute); cut information retrieval time by 83 percent (from 12 minutes to two minutes per customer); shortened customer referral time by 96 percent (from 45 minutes to two minutes); accelerated feedback escalation time by 80 percent (from five minutes to one minute); and reduced telesales time by 80 percent (from 15 minutes to three minutes per referral).

COMPANY PROFILE

DELIVER THE DEFINITIVE CUSTOMER EXPERIENCE TO INCREASE PROFITABILITY

Effective businesses today must earn their customers' trust. They must learn from every interaction to deliver a superior customer experience, expanding customer loyalty to create a lasting competitive advantage.

Nortel Networks Customer Contact and Self-Service Solutions help businesses deliver a definitive customer experience and provide exceptional innovative services tailored to individual customer needs that increase retention and improve profitability.

**NORTEL
NETWORKS**

center agents, and 60 million calls per day in over 100 countries worldwide. More than 7,000 customers automate interactions using Nortel Networks self-service and speech applications. In 2002, Nortel Networks held the number-one call center market share for agent shipments in North America. Nortel Networks is also number one in global Interactive Voice Response (IVR) and speech applications shipments.

VERSATILITY AND SEAMLESS INTEGRATION

Solution versatility allows a company to start modestly with a single site or as ambitiously as a global, multimedia implementation. Either way, businesses are assured that each investment made in Nortel Networks products or services will integrate seamlessly today and in the future.

Nortel Networks is one of the world's largest providers of high-performance converged networks with the quality, reliability, scalability, and security to serve as a new foundation for global communications, including customer contact and self-service applications unified with CRM.

Nortel Networks has been a leader in the customer contact business, both agent-assisted and self-service, for 30 years. Today customer contact solutions support more than 35,000 contact centers, three million contact

ONE NETWORK. A WORLD OF CHOICE

These solutions position a business for transformation into a proactive entity that anticipates customer needs and satisfies them with time-sensitive, valued information, wherever they are. This visionary approach—a new model of engagement with customers called “One Network. A World of Choice”—includes everything being done today in contact centers, self-service, CRM and more. A business can evolve by enhancing existing solutions to optimize investment while receiving revolutionary benefits.

Nortel Networks' versatile, comprehensive Customer Contact and Self-Service Solutions provide an extraordinary foundation for success.

To learn more about how a company can gain a competitive advantage using these solutions, contact a local Nortel Networks office or please visit the web at www.nortelnetworks.com.

NORTEL NETWORKS CRM SUCCESS FOR CADENCE DESIGN SYSTEMS

"WE HAD A GREAT CRM PRODUCT, but our telephony infrastructure was not allowing us to get the most out of it," says Jack Yothers, senior project manager at electronic design automation (EDA) industry leader Cadence Design Systems, Inc.

Headquartered in San Jose, Calif., Cadence is the world's largest supplier of electronic design technologies, methodology services and design services for a variety of electronics-based products. To stay competitive in the highly dynamic and complex EDA industry, Cadence recently implemented a CRM solution from Siebel Systems. Although the solution offered numerous features important to improving customer experiences, Cadence's decision to rely on its older communications infrastructure was getting in the way.

"We were experiencing continued system problems, the toolbar didn't function like it was supposed to and we were simply unable to take advantage of many features, including IVR enhancements," explains Yothers.

Not surprisingly, Cadence began phase II of its CRM implementation looking for a partner to help with the upgrading of its telephony and call center infrastructures as well the enhancement of its self-service IVR application.

According to Yothers, Cadence evaluated several vendors, choosing Nortel Networks based on best price/performance, ability to provide improved Computer Telephony Integration (CTI) integration with Siebel's CRM software and willingness to act in partnership with Cadence.

PARTNERSHIP KEY TO SUCCESS

"We did not want a 'consultant', we wanted a real partner with this upgrade," says Yothers. "We needed a vendor

that would take pride of ownership with their product and stick around to feel our pain if things took a wrong turn. Nortel worked with us from the very beginning until long after we went live with phase II—they were just like a member of the IT staff on this project," he explains.

And nowhere was the partnership mentality more apparent than in the need to provide improved CTI with Siebel's solution.

"Not only did Nortel deliver on the integration—we have a fully-enabled CTI toolbar with Siebel 6.3—they actually trained our in-house developers and worked together with them to implement the final product," says Yothers. "We are extremely happy with how this turned out. Because our own developers were intimately involved, we were not left feeling as if something we didn't know or understand had been placed between the application and our network. Nortel really partnered with us; it's one of the chief reasons our CRM implementation has been such a success."

As primary provider for phase II, Nortel Networks has helped Cadence upgrade its call center with skill-based routing, including Web Client browser-based administration; added Network Control Center (NCC) to manage call traffic across the virtual network; upgraded the IVR system to Nortel Networks VPS/is; and installed Integration Package for Meridian Link (IPML) for tighter integration between the call center and IVR.

"Nortel's performance with this upgrade gave us the confidence to continue our partnership with them as we expand our contact center operations globally," says Yothers.

**"NOT ONLY DID
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IMPLEMENT THE
FINAL PRODUCT."**

—Jack Yothers, Cadence Design Systems, Inc.

For more information, contact
www.nortelnetworks.com

NORTEL
NETWORKS

THE ROI OF CRM STRATEGIES

your company from any channel—from website to call center to sales force to marketing brochure.

“With the creation of a warm hand-off process, opportunity can be passed directly to the correct department,” says Michael Koval, vice president and CIO at Long & Foster Cos., a real estate services provider with more than 10,000 sales associates. “Based on customer demands and expectation, service lines can either be created or modified. Basically, you align the customer demands to your product offerings.”

ACHIEVING THIS REQUIRES:

- Maintaining the quality of customer interactions by tracking and analyzing all interactions with the aim of refining and improving them in the future;
- Acquiring appropriate knowledge

about customers with each interaction; ■ Integrating customer data so that it's as complete and accurate as possible and making it accessible and useable.

Using Oracle's E-Business Suite to update its ERP system and add CRM capabilities, C-COR dropped days sales outstanding by 8 percent, which translated into a one-time \$3.7 million reduction in the company's accounts receivable balance. The firm also slashed engineering change order process time by 85 percent and cut monthly closing time by 50 percent.

IT'S ROLE: THE IMPLEMENTERS

“CRM implementations fail because they're seen as only an IT implementations,” says Steve Wright, vice president of CRM deployment at IBM. “Without changing the supporting

processes and the surrounding employee behavior and culture, driven from the highest executive level, you will not succeed.”

IT might not own CRM, but it's usually responsible for the care and feeding of CRM technologies and solutions.

Failed CRM projects tend to lack customer-centric strategy, shun organizational change, fail to benchmark and don't keep end-users happy.

Successful CRM efforts share these qualities:

- **Customer-centric strategies.** Customers are looking for added value, so figure out how to give it to them. Using PeopleSoft CRM, financial services consultant Carreker Corp.'s ability to identify unmet customer needs and then cross-sell and up-sell its products

COMPANY PROFILE

CRM SOLUTIONS HELP DEVELOP LONG-TERM, PROFITABLE CUSTOMER RELATIONSHIPS



Are you looking for a Customer Relationship Management (CRM) solution that will help:

- Optimize your marketing dollars across all communication channels?
- Enable your sales representatives to drive buying decisions and increase revenue?
- Ensure your support and service organizations are providing a positive customer experience with every interaction?

PeopleSoft CRM solutions help you achieve these goals by providing a comprehensive set of tools and services that integrate with your existing business processes.

PeopleSoft®

DETERMINE THE REAL VALUE OF EACH OF YOUR CUSTOMERS

Today, PeopleSoft's comprehensive, award-winning set of CRM solutions is helping businesses like Pepsi Americas, Hewlett-Packard, Lufthansa, Nextel, Electrolux, Toyota, Time Inc., NEC and DoCoMo Systems develop long-term, profitable customer relationships.

BEST-IN-CLASS CRM MODULES

The 2003 InfoWorld Reader's Choice Award for 'Best CRM Product', PeopleSoft's CRM solution offers speedy implementation (it's built on PeopleSoft's Pure Internet Architecture™); provides support for smart business processes (embeds real-time analytics), is easy to use (simplified navigation and user interface that presents information in context), eliminates costly customization (deep, out-of-the-box functionality) and integrates easily with PeopleSoft and non-PeopleSoft applications.

These solutions help companies address rising customer expectations,

expand globally while cutting costs and improve business processes through leading-edge analytics. For example:

- PeopleSoft Marketing offers personalized dialogs, advanced customer profile management to improve audience segmentation and real-time analytics, including "Smart Views," best-of-breed online marketing, robust event-triggers, budget and task workflow.
- PeopleSoft Sales module offers flexible forecasting and territory management. The Advisor module enables real-time evaluation of customer needs. The Enterprise Pricer supports complex

pricing configuration. Order Capture solutions integrate pricing, customer and order information into a single product.

- PeopleSoft Service enables organizations to create and run a successful, real-time service organization, leverage enterprise knowledge for fast and effective service, enable a multichannel contact center, improve agent productivity and boost revenue by capturing cross- and up-sell opportunities.

What's more, PeopleSoft CRM product modules can be combined in a number of ways to address particular business challenges. And, in addition to a complete portfolio of marketing, sales and service solutions, PeopleSoft also offers industry-specific CRM solutions for communications, energy, government, high tech, financial services and insurance—as well as support for multiple languages and currencies.

For more information, call 1-800-380-SOFT (7638) or visit

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PeopleSoft® | Customer Relationship Management

THE ROI OF CRM | STRATEGIES

and services will result in an estimated 10 percent revenue growth with no additional employees.

- **Careful planning and benchmarking.** You'll need realistic, measurable metrics—e.g., productivity increases, faster sales cycles—that signal revenue growth and/or cost reductions. And you'll need to benchmark so you can make before-and-after comparisons.
- **A champion.** Sponsorship from the top is critical.
- **Early involvement of end-users and designs that keep them happy.** During the planning phase, do more than just gather project requirements—use the effort as an opportunity to gather project support, too. Anticipate fear of change, especially

from sales staffs who want to preserve their independence, by showing end users what they'll gain—e.g., realtime access to customer data, easy access to accurate product inventories. Make sure the CRM user interface is friendly and smoothly navigable.

- **Incremental rollout.** One approach is to define a small number of small projects—each needing just a few months to implement—that you believe will deliver the best results.
- **Willingness to make organizational changes.** You may need to redraw functional boundaries and redesign workflows. For many organizations, CRM efforts are most successful when they involve process change. Carreker Corp. overhauled its customer support call center with

automated workflow and improved processes to save \$200,000 per year while boosting customer satisfaction.

“Traditional internal processes tend to be silo-oriented, driving efficiency only within their function,” says Peter Andino, vice president of global sales and technical support at IBM. “CRM doesn't work in silos. Rather, it requires an end-to-end ‘horizontal’ view of the process linkages. When the hard work of process re-engineering is not done, your CRM system is going to be less successful.”

- **Training for those whose jobs will change.** They'll need more than just tech training; you'll need to explain and justify the changes you're imposing on their working lives.

- **Integration of data, apps and processes.** As CXOs seek better ways to measure and assess financial and operation performance across the enterprise, CIOs must integrate—not just data, but also applications and sometimes even business processes. This can result in initiatives that link CRM with other key corporate systems, such as enterprise resource planning (ERP), enterprise marketing management (EMM), supply chain management (SCM), product lifecycle management (PLM) and service lifecycle management (SLM).

Canada Post Corp., Canada's fifth largest employer, is using mySAP CRM to integrate 80 legacy systems, increase cross-selling and up-selling opportunities, reduce data entry and maintenance costs, deliver superior customer service while streamlining processes and increase sales force efficiency. The company expects to eliminate 26 percent in revenue leakage and projects an ROI of 26 percent.

“CRM, by its nature, calls for a companywide focus,” says Andino. “Every function within a company needs to understand its role in creating customer satisfaction.” **SD**

SELECTING CRM VENDORS: SUITE VS. BEST-OF-BREED

“Businesses understand much better now what information technology can do for improving how they work with their customers and partners,” says John Wookey, senior vice president, applications development, at Oracle Corp. “As the economy rebounds, more and more companies will return CRM to the top of their shopping lists as they focus on harnessing customer information, wherever it may lie within an enterprise, to put the customer at the center of their businesses and maximize the value of their networks of relationships.”

Whether you should opt for a CRM suite from a single vendor or an assortment of best-of-breed applications depends on the complexity of your implementation as well as whether you'll be relying on systems integrators and/or external service providers.

Gevity HR has implemented several Oracle E-Business Suite components with impressive results: 27-percent reduction in transaction worktime, a doubling of payroll staff productivity in 18 months and a 6-percent rise in client retention.

“There are 40 to 50 different types of solutions that fit under the CRM umbrella,” says Laurie McCabe, vice president at consultancy Summit Strategies. “Some vendors cover a lot of this territory in a suite with different modules; others offer very specific point solutions. There are trade-offs in either approach, but make sure to fully understand them relative to your business' own unique requirements.”

Advises Michael Dunne, vice president and research director at Gartner, Inc.:

- Do your homework and follow a formal evaluation process.
- Remember: you are not just buying a product, but also relationships.
- Pay attention to the total cost: software typically represents only a portion of your total cost; services represent the greatest risk and most expensive part of the endeavor.
- In this uncertain business environment, don't ignore vendor viability.

FRONT OFFICE AND BACK: THE OPERATIONAL SIDE OF CRM

FRONT-OFFICE CRM solutions focus on three key customer-facing or customer-oriented functions: sales, customer service and marketing. The payoffs from each can be impressive.

SALES PAYOFFS

When sales people can spend more sales time with customers, the top line benefits:

SALES FORCE AUTOMATION. After implementing Siebel eSales and Siebel Finance, Robeco Bank Belgium saw the number of customers each of its account managers could handle jump by 20.

PERCENT. Prior to its 2001 launch of mySAP CRM, third-party agents for IPSOA, a leader in the Italian publishing market, spent approximately 35 percent of their available selling time in problem-solving mode. Today, IPSOA sales agencies conduct an average of 1.5 more customer visits per week, and agents' selling time has increased from 65 percent to 75 percent of overall time.

SALES CONFIGURATION. Thanks to Siebel's eConfigurator, Asyst Technologies, maker of semiconductor automation systems, has become 50 percent more accurate in its materials inventory forecasting, and in one sales group the average order configuration time has dropped from 25 days to two days.

ORDER MANAGEMENT. As part of an integrated provisioning process based on Siebel and TIBCO solutions, Oklahoma-based WitTel Communications has reduced order entry errors by 25 percent, enabling it to reassign 12 employees. The

company estimates that it's saved 450,000 person-hours, and reductions in paper processing alone save \$10,000 per month. Customer-requested due dates are now achieved 90 percent of the time, up from 40 percent, which has helped to raise customer satisfaction levels from 56 percent to 89 percent.

SALES PORTALS. After implementing a portal using Siebel CRM, AMP Financial Services cut the time needed to route leads from nearly two weeks to just 30 minutes.

cent ROI—and calculates that the reduction in product returns will save it more than \$1.6 million annually.

CALL CENTERS. Using Nortel Networks' Symposium Call Center has enabled New Zealand's APN News & Media to cut call handling from five minutes to 3.5 minutes and to reduce time-on-hold to one minute from three-to-four minutes. British outsourcer Vertex has reduced call center operational costs by 10-to-30 percent with Symposium, and the productivity of its home-based employees

"CRM-ENABLING TECHNOLOGIES SHOULD HELP AN ENTERPRISE ENHANCE PERFORMANCE IN ALL AREAS ... THAT MAKE DOING BUSINESS CONVENIENT AND EFFORTLESS."

—Roxann Swanson, general manager, customer contact and self-service solutions, Nortel Networks.

E-TAILING. Digital Wellbeing, a major e-business for UK pharmacy giant Boots, is using mySAP CRM to enhance the e-tailing experience for its health and beauty products customers. The company expects to derive a 72-percent internal rate of return from its mySAP CRM initiative.

CUSTOMER SERVICE PAYOFFS

mySAP CRM is helping Brother International reduce product returns and anticipate customer needs. The leading manufacturer of fax, printers and multi-function products projects a 129-per-

cent ROI—and calculates that the reduction in product returns will save it more than \$1.6 million annually.

Since 1999, when it deployed Siebel's Automotive Call Center, Mitsubishi Motors North America has boosted call center volume by 75 percent, lowered per-call costs by 38 percent and reduced its call-abandon rate by 8 percent. After using Siebel Call Center to streamline dozens of business processes, Asyst Technologies reports 22,000 hours in productivity savings—and cost reductions of \$1.7 million—in its call center.

The UK city of Hull has used Oracle CRM technology to implement a multichannel customer service center

THE ROI OF CRM | OPERATIONS

that has cut lost calls from 14 percent to one percent, raised the number of calls answered from 57 percent to over 98 percent, and saved the city \$190,000.

SELF-SERVICE. With PeopleSoft CRM, Carreker Corp. anticipates savings of \$1.2 million per year by deploying customer self-service. The firm has reduced helpdesk call volume by 90 percent; customer support headcount is down by 25 percent. Ten databases have been combined into one, and three customer support systems have been consolidated for a savings of \$450,000 per year. Carreker estimates that by moving just 10 percent of its customers to self-service, it can add up to 20 new customers without adding staff.

Taking aim at its heavy email volume, retailer Eddie Bauer used Kana IQ to add self-service capabilities and a smart email management solution. In the first month of deployment, 80 percent of customer inquiries were handled by 'Ask Eddie,' Eddie Bauer's self-service application. Today all email inquiries are answered in under two hours. The first company of any kind in Israel to adopt a comprehensive, automated, intelligent self-service solution into its call centers, Bank Leumi's successful deployment of Kana IQ has resulted in training cost savings of 66 percent as well as a 17 percent boost in call avoidance.

FIELD SERVICE AUTOMATION (FSA). Storage networking solutions provider CNT's field engineers have realized an estimated 1,800 hours of productivity savings after deploying Siebel Field Service automation.

MARKETING PAYOFFS

Aegis Communications Group uses PeopleSoft CRM to reduce the time it takes to develop telemarketing scripts from a week to a couple of days. Result: marketing programs are developed and executed 50 percent faster.

Hewlett-Packard Corp. is using

Kana Marketing to dynamically select the most appropriate channel partner to follow up each lead, and to manage and follow up leads in real time, thus increasing the effectiveness of indirect sales channels and priority-direct sales. Result: direct sales revenue has increased by 250 percent in the first six months and channel switching is down by 50 percent.

BRINGING IT TOGETHER

"CRM-enabling technologies should help an enterprise enhance performance in all areas—sales, marketing and customer service—that make doing business convenient and effortless," says Roxann Swanson, general manager, cus-

tomers contact and self-service solutions at Nortel Networks.

"To maximize effectiveness," she adds, "these technologies must also embrace the cornerstone of customer interactions—contact centers and self-service applications—which need to be integrated seamlessly with face-to-face interactions and unified with CRM and other business applications to create measurable and manageable business operations. Then an enterprise is able to take the customer's point of view, to keep learning about individual customers and to use this knowledge to creatively differentiate an individual offer to strengthen customer loyalty." **SD**

GETTING SMARTER ALL THE TIME: CRM ANALYTICS & BUSINESS INTELLIGENCE

ACCORDING TO AN IDC study, organizations that have successfully implemented analytic applications have seen returns stretching from 17 percent to more than 2000 percent; the study found a median return on investment (ROI) of 112 percent.

That's because business intelligence tools and analytics solutions help them achieve insight into customer behavior and values and use this information to holistically manage marketing performance. The paybacks can be significant:

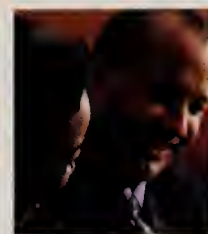
In 2002, GlaxoSmithKline AG upgraded its database and business

intelligence toolset, opting for Oracle's Warehouse Builder, Sales Analyzer, Reports and Portal. Now the pharmaceutical company can collect business-critical information in real time and compare its performance to competitors', using the knowledge to figure which products are most profitable. Result: report generation times has been cut from four hours to seconds, ETL (extract-transform-and-load) time needed to clean the data has shrunk from 18 hours to 30 minutes, administration costs have been reduced by 50 percent and forecasting time is expected to go down 70 percent.

The Bank of Montreal uses IBM's



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Executives



2004 Strategic Directions Series

Strategic Directions supplements focus on key business-critical technologies and solutions with in-depth, comprehensive coverage, analysis and market data. Produced by CXO Custom Publishing, and distributed full run in CIO and CSO magazines, each issue addresses key concerns and trends with tools, tips and insight from industry experts and relevant case studies from the field.

Strategic Directions Calendar for 2004:

Secure Networks
Issue Date: April 1

The Integration Imperative
Issue Date: June 1

Business Intelligence IQ
Issue Date: September 1

ROI of Storage
Issue Date: November 1

For information on CXO Custom Publishing Strategic Directions Supplements, contact Mary Gregory, Director of Custom Publishing at 508.988.6765 or mgregory@cxo.com or John Danielowich, Project Manager at 508.988.6775 or jdanielowich@cxo.com.

Secure Networks: How to Ensure that Your Business is Protected from the Outside In

Since 9/11, enterprises have done a good job reassessing and protecting their internal information assets. But what about the networks that connect with external partners, customers and employees? Who is monitoring and securing these connections—and ensuring that they are equally protected from external threats? This supplement tackles the security, recovery and business continuity issues that CIOs face as they strive to protect their critical information networks.

The Integration Imperative: Leveraging Legacy Systems to Create New Value

We all have legacy systems running key business operations today. But how can these legacy systems be integrated in new ways, using new technologies, to drive new value in our enterprises? This supplement explores key integration issues—how to unite disparate systems, how to anticipate integration challenges—as well as the key solutions that come with trying to get the most out of integrated legacy systems.

Business Intelligence IQ: A User's Guide

We've all come to understand the value of business intelligence (BI) and the role it plays in ensuring that we pay attention to the right concerns and customers. But how do you know whether you've got the systems in place to uncover the right BI? And how do you know you're taking full advantage of this information to make smart, informed business decisions? This supplement explores how to measure and maximize BI—including the latest tools & methodologies.

ROI of Storage: Strategies for Success

In 2003, we gave you New Storage Solutions—strategies for effective data and storage management. This year, we aim to share some strategies and solutions to ensure that you maximize the dollars you spend on storage management, including; cost-effective techniques and tools, storage management plans and calculating the ROI from storage solutions.

THE ROI OF CRM | ANALYTICS & BI

DB2 and Information Warehouse software to analyze the data it gathers on several million customers to help decide product pricing, channel migration, resource planning, etc. The bank expects to save more than \$270 million in four years and anticipates a shift to realtime analysis in a couple of years.

Using BI software from Brio, Toyota Motor Sales USA has reduced its vehicle transport time from 36.5 days to 17.5 days, saving millions. And significant reductions in time needed for reporting and analysis—thanks to automated exceptions-based reporting—has enabled Toyota to reassign five analysts to other tasks. It's all added up to an annual ROI of 605 percent.

“MOST COMPANIES MAKE THE MISTAKE BY THINKING OF CRM ANALYTICS AS AN AFTERTHOUGHT.”

—Joe Davis, vice president and general manager, PeopleSoft CRM.

ANALYTICS EMBEDDED

“Most companies make the mistake by thinking of CRM analytics as an afterthought,” says Joe Davis, vice president and general manager, PeopleSoft CRM. “Analytics should be

embedded into the application, thus enabling intelligent processes and decreasing the complexity of analytic systems.”

To get started, advises Davis, focus on:

- Understanding the specific processes that your organization has automated, and use analytics to identify the areas that are having the most impact on the business.
- The key customer metrics that drive your organization's business.
- How to distribute the insights to the appropriate users, in the appropriate format, within their business processes.

“Organizations that understand their users, and their users' needs,” says Davis, “will ensure analytic success.”

CASE STUDY

E-BUSINESS SUITE AUTOMATES AND INTEGRATES UL SALES AND SERVICE

Underwriters Laboratories Inc. (UL), the independent, not-for-profit safety organization, serves more than 66,000 customers in 99 countries. To stay close to its customers, Chicago-based UL operates 55 laboratories and testing and certification facilities around the world. But until recently, the company had a hard time coordinating customer service and sales activities between the different branches.

GAINING A COMPLETE CUSTOMER PICTURE

All that changed when UL began implementing Oracle E-Business Suite, a tightly integrated set of enterprise applications that seamlessly connects UL offices worldwide. Using the suite's advanced CRM applications, UL is boosting operational efficiency and taking advantage of a host of new sales and customer service opportunities.

“We needed a solution that enabled us to capture much more information about each customer and share that information globally,” says Gary Schrempp, UL's director of business transformation.

LOWER TCO WITH BUILT-IN INTEGRATION

UL especially likes the fact that Oracle E-Business Suite applications are engineered to work together as a unit. Oracle's built-in integration also low-

ers UL's total cost of ownership—a big plus. Implementing competing solutions would have required UL to build and maintain an interface between them—a costly and time-consuming add-on.



NEW PROCESSES BRING RELIEF

UL is using Oracle Interaction Center (also part of Oracle E-Business Suite) to fundamentally change its customer service processes.

“We can take as much as 40 percent of the workload off of our technical staff,” says Schrempp, “and focus our engineering staff on true engineering work, which will get us better responsiveness. We are expecting to see improved service to all our customers.”

MORE OPTIONS FOR SMALL CUSTOMERS

Small customers will be able to get information, order any needed information products and even apply for testing services via UL's new online storefront built using Oracle iStore. Schrempp believes that a convenient, channel-like Oracle iStore will better suit many customers' needs “and suit our needs better, too, in terms of efficiency and closing the sale.”

For more information about Oracle E-Business Suite and other Oracle CRM applications, please visit www.oracle.com.

IBM'S INTERNAL, COMPANYWIDE CRM TRANSFORMATION

IBM'S CRM INITIATIVE is one of the largest to date. When completed in 2005, IBM's hundreds of thousands of customers, employees and partners will have a single, integrated view of customer information, sharable across applications, time zones, business units, etc.

IBM is using Siebel Systems' eBusiness applications (more than 80,000 licenses have been purchased), IBM's DB2 database, WebSphere e-business infrastructure software, MQSeries messaging software and a combination of IBM eServer pSeries systems coupled with an enterprise storage server (sometimes known as Shark).

WHY DO IT?

IBM's overall goal, says Peter Andino, vice president, global sales operations and technical support, is to ensure that each and every customer interaction is handled with the same degree of excellence using the same tools and data across all IBM geographies and sales channels. This will improve customer satisfaction and encourage collaboration among employees and business units. The company will also reduce the number of internally supported IT systems from about 800 in 1997 to less than 200 by 2006.

WHERE TO BEGIN?

According to Vince Ostrosky, vice president, CRM, the initiative started with a companywide look at how its organization and processes supported (or didn't support) its customers. The point was to evaluate the effectiveness of each process by asking: "Is the way we do this now the right way, the best way to support the customer?"

WHAT'S THE PLAN?

IBM began with "a careful, measured" initial rollout of Siebel's call center package to 26 ibm.com call centers. As of October 2003, the system has been deployed in 47 ibm.com call centers in 32 countries. Now the company is tackling marketing and field sales and services; by the end of 2003, IBM will have "CRM-ed" over 40,000 employees in 47 countries.

WHAT'S BEEN LEARNED SO FAR?

Among the key lessons gleaned so far, say Ostrosky and Andino:

- **You need genuine support from the top.** And make sure you have the support of the executive sales team.
- **You must be able to say no.** To deliver a truly enterprisewide CRM solution, CIOs have to be firm and just say no to any request for separate CRM solutions.
- **CRM is not just an exercise for IT.** Without the cooperation of each business unit, an enterprisewide implementation like CRM is not possible. Data integration is key.
- **Data is dirtier than you believe.** Yes, says IBM, what you feared is true: your data is in much worse condition than you thought. If you want the full benefit of your investment in CRM, start thinking about how to clean it up now.
- **Think about the training.** You cannot pull frontline people off their posts and stick them in training for weeks at a time; the business units can't afford to lose the man-hours.

WHAT ABOUT THE BENEFITS?

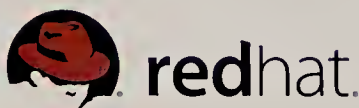
IBM keeps ROI particulars to itself, but they're substantial and focused on:

- Improved sales productivity, effectiveness and channel integration;
- Increased visibility to market dynamics and the sunseting of hundreds of non-integrated legacy applications;
- Higher customer satisfaction through better responsiveness and ease of doing business;
- Improved sales management effectiveness, reflected in tighter management and controls and proactive sales coaching;
- Better forecast accuracy and reporting;
- Enhanced partnership management.

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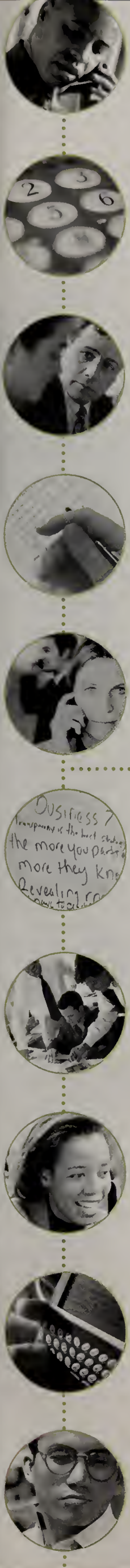
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Discussion topics include:

- **Standards:** What are the high stakes battles and how will the outcome shape products and services?
- **Open source:** Is the current litigious environment seriously hurting the adoption of Linux?
- **Software quality:** The complaints about the overall lack of quality of major commercial software are endless. What can and is being done to make it better?
- **Technology fear factor:** Are we stifling innovative products and services because CIOs are afraid to buy from small firms and start-ups?
- **Reality bites:** Many enterprise applications turn into major disappointments, if not disasters. Were they over-hyped? Were our expectations unrealistic? What separates winners from losers?



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HOW TO PLAY TO YOUR AUDIENCE

Is your website easy for Maude to use? Or, for that matter, Tiffany or Raul? Here's how to sync up your website with your audience. BY MERIDITH LEVINSON

WHEN it comes to website look, feel and functionality, many companies have let technology, development tools and hunches do the driving rather than data about customers' needs. But with e-commerce maturing, some B2C (and B2B) sites have become overloaded with information leading to confused navigation, grandfathered dead ends and, ultimately, frustrated end users. Worse, the site might be playing to the wrong audience, especially if your business model has changed or your audience has matured. If it's time to update your website, "persona-based design" can put customers—rather than servers,

GIFs or programming languages—at the center of discussions on designing user interfaces.

With persona-based design, ethnographic researchers study the behavior of current and potential customers by conducting interviews with them and by observing not only their use of the website but their daily routines. Based on these findings, research, design and development teams draw up anywhere from two to five different character sketches—known as personas—which represent basic types of customers.

When Medco Health Solutions undertook a redesign of its website, Medcohealth.com,

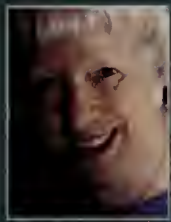
in 2002, the pharmacy benefits manager hired a Web design company that employed the persona-based methodology to gear the site toward an aging population and to untangle its labyrinthine taxonomy. Steve Gold, the former CIO of the Franklin Lakes, N.J.-based company, says he saw persona-based design as a way to bring end users to life for the digital design group and pertinent business units. "We wanted the developers and workgroups to have empathy for the individuals they were building the software systems for, having them rally around somebody tangible as opposed to just building a

Reader ROI

- ▶ Why the audience should drive website design
- ▶ How to turn user research into persona-based design
- ▶ Where to see the results of customized design—in completed shopping carts and increased orders

USE YOUR VIEWERS TO DRIVE YOUR DESIGN

In Medco Health's persona-based design, characters based on audience research (such as the four below) influence everything from font and type size to product-ordering architecture

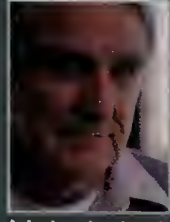


Name:
Maude Baruso
Age: 75
Ailments:
Glaucoma,
arthritis

Degree of Web savviness: Low

DESIGN CONSIDERATIONS:

Provide large, easy-to-read fonts; clear, definitive color contrasts; large buttons; plain language. Streamline processes for ordering prescriptions. Provide clear directions.



Name:
Frank Anderson
Age: 63
Ailments: Heart
disease, high
blood pressure,

high cholesterol

Degree of Web savviness: Low

DESIGN CONSIDERATIONS:

Find ways to motivate him to take his medications; explain processes using plain language; provide info on medical conditions.



Name:
Sandra Reizler
Age: 56
Ailments:
Osteoporosis
Degree of Web

savviness: High

DESIGN CONSIDERATIONS:

Provide people like Sandra, who care for themselves as well as another person, with online tools to manage all their prescriptions.



Name:
Chris Bell
Age: 33
Ailments:
Diabetes
Degree of Web

savviness: High

DESIGN CONSIDERATIONS:

Provide customers like Chris with information about his condition and new treatments; make ordering prescriptions fast and efficient.

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BEFORE

Medcohealth.com's homepage was cluttered with small type, making it hard for users (especially the elderly) to find information—instead they called the help desk.



AFTER

Today, the fonts are large, there's plenty of white space to navigate around, and buttons and tabs are easier to see.



Prescriptions & benefits

Health & w

Drug information

Search for medication informati

Enter a minimum of the first three li

search

Home delivery prescriptions you can order today

Check the box next to the prescriptions you want to order, then click the "add to shopping cart" button below.

[Display details for each prescription](#)

Chris

☐ Humulin U Ultralente 100 units/mL
Rx# 123456789012

☐ Metoprolol Tabs 50mg
Rx# 123456789222

Refill now

[remove from list](#)

Will process on Oct 17, 2003

Renew now

[remove from list](#)

We will contact your doctor

- Chris Bell, representing the savvy Web user, would appreciate the sophistication of the drug information and ordering pages.

NOTE: Like the personas used to create Medco Health's website, the webpages shown here are fictitious.

website in a vacuum, which is the more conventional way of doing it.”

Working with Cooper, a San Francisco-based Web company that developed the persona-based methodology, Medco Health designers created four fictional characters whose lives and ailments were based on their own research as well as real people Cooper interviewed. They used these characters to guide the redesign of Medcohealth.com and invoked them during meetings or alone in their cubicles when hashing out the layout of the new site. By focusing their redesign efforts on a particular demographic and by conducting in-depth research into this segment's lifestyles, health issues and Web literacy, Medco Health was able to create a website that met its users' needs—without disagreements based on gut feelings about what customers wanted and needed. Because the site was so well attuned to the reasons why customers visited, the company was also able to minimize the number of costly changes it had to make to the site after actual users tested it.

Did it work? Since the redesign, Medco Health has increased the number of prescriptions it processes through its website by 26 percent and has boosted online sales.

What follows are Medcohealth.com's steps through persona-based design to ensure that the new site would meet customers' needs and be easy for them to use. It's a formula that will work, whether you're trying to reach Maude—or a Tiffany or a Raul.

LOST IN SPACE

1 Define the problem. According to ComScore Media Metrix, Medcohealth.com is one of the largest e-commerce sites, but in the five years it was live before the redesign, it had become so loaded with bells and whistles that consumers could no longer quickly and easily find what they were looking for. Users had such a hard time locating information about their prescriptions on the site that they

began contacting the help desk for assistance. The number of abandoned shopping carts was rising. But Medco Health really wanted users to order through the site—the cost of processing orders through a call center ranges in the dollars versus cents for the Web, according to former CIO Gold.

The average age of a Medcohealth.com user is 54 (and not getting any younger).

By conducting in-depth demographic research, Medco Health created a website that met its users' needs—without disagreements based on gut feelings.

Forty-four percent of all Medcohealth.com users are over 55. And, according to Gold, “they're the folks who are using a disproportionately high number of meds. They are our most valuable customers. That puts us in a situation where we have to make sure we're meeting the specific needs of the senior population.”

Kim Goodwin, vice president and general manager of Cooper, who worked on the Medcohealth.com redesign, summed the site up as a little overwhelming. “Before the redesign, there were a lot of very small, very dense fonts that [even] I had a hard time reading, and I'm not 65 or even close,” she says. “There was a lot of fairly low contrast in colors. There were a lot of ways to get from one place to another, a lot of redundant navigation. It was pretty easy to get lost.”

2 Gather the data. Web design experts agree that intimately understanding the characteristics and behavioral qualities of your most important constituency is an efficient and effective way to design your website. And that's the starting point for per-

sona-based design. Cooper extensively interviewed approximately 40 people, identified by several market research firms around the country as typical Medco Health customers, about their privacy concerns and the reasons why they did or did not order prescriptions online. The research team also observed some of these individuals on the Web and offline.

“The behavioral data that serves as the

foundation of the personas is what really makes them work,” says Goodwin. While you could create personas out of whole cloth, they won't carry the same weight, she adds, and they wouldn't accurately reflect your users.

3 Develop the personas. After conducting the field research in October 2001, the team from Cooper aggregated that data about the different customers, their illnesses and behavioral patterns to shape it into individual personas or character sketches that represented four basic types of customers, their needs and behaviors. Each persona was given an approximately 500-word life story to help create an emotional bond between the developers and the people for whom they were redesigning the site.

As Goodwin says, the purpose of the personas is “to get everyone thinking in a unified way from a user's perspective.” She says most companies gather their marketing and Web teams in a conference room and argue about what users want. Sometimes they have

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data to substantiate their claims, but it's usually based on dubious research or intuition. Companies that take that kind of disorganized approach "do version 1.2 and 1.3 and 1.4," she says. "They keep trying to get it right, and it costs them a fortune. It also costs them a market opportunity. Someone else probably figured it out while they were iterating. By using the personas, you cut through all that." In fact, she says, clients have told her they've cut development time by as much as half using persona-based design.

Harley Manning, a principal analyst with Forrester Research who studies software and Web user interface design, concurs. "By focusing everyone on the same understanding of who they're designing for, you eliminate a lot of the battles that occur over what should be on the homepage," he says.

4 Meet and greet. Once the personas were drawn up, everyone on the redesign team gathered in Medco Health's cafeteria to "meet" Maude Baruso, Frank Anderson, Chris Bell and Sandra Reizler. The company's Senior Director of E-Commerce Marketing Vicente Caride and his colleague on Medco's business side, Amy Foley, came up with the idea to have different people on the team pretend to be the various characters. One man donned a cardigan and wig to pretend he was Maude, acting out a script that was designed to introduce the rest of the team to Maude and her needs. A pop quiz—"Who takes Celebrex twice a day for arthritis of the hands and hips" and "True or False: Sandra uses a computer at home and in the office"—made sure that everyone involved knew the personas intimately.

Caride says this exercise was done early on in the redesign process, in November 2001, before they had even started prototyping, so that designers would have time to steep in the personalities of Medco Health customers. "The earlier in the process you introduce the personas, the better defined your path will be through to completion,"

says Caride. "If you introduce them later on, you're going to introduce new forks in the road. We wanted to know what the road was going to look like."

The redesign team purchased photos to go with the persona descriptions from a stock agency to distribute to team members for their cubicles, and blew them up to poster size to

put in meeting rooms. They also set up e-mail addresses for each of the personas, like *Maude@aol.com*, and pretended to exchange e-mail with them.

5 Work with the personas. Soon, the personas weren't just pictures on the walls. Caride says staff brought the

DESIGNING FOR THE OLDER SURFER

According to the U.S. Census Bureau, citizens 55 and older made up 22 percent of the U.S. population in 2003. In 10 years, that demographic is expected to grow to almost 26 percent.

ERIC SCHAFFER, CEO AND FOUNDER of Human Factors International, a user-centered design company based in Fairfield, Iowa, says an increasing number of his clients are reaching out to older consumers through their websites. "The population is aging, and certainly we see a general awareness of that. We also see specific sites that are oriented to older populations, particularly medical sites as well as investments," he says.

When companies make their sites easier for older people to use, it enhances usability for everyone, says Harley Manning, a principal analyst with Forrester Research, who focuses on user-interface design. "There's no downside to designing your site for the aging population, and there's lots of upside," he says. The following tips for designing websites for older users often translate to better experiences for younger users too.

DO

- **Use large, clear fonts.** Your users' vision is on the decline.
- **Make sure color contrasts are clear.** This increases visibility and response times.
- **Enlarge buttons and tabs as well as the spaces between them.** Making buttons and tabs bigger will help prevent users from accidentally clicking on the wrong thing.
- **Create "alt-tags."** These little notes appear when you roll your mouse over an area of the screen, and explain what you'll get by clicking on a certain link, making navigation easier.
- **Build reassurance into transactions on the website.** Give simple, clear, step-by-step explanations on how to place orders without forcing users to remember anything from one page to another.

DON'T

- **Use lurid colors.** They appeal more to young people than to seniors.
- **Use italics.** They're hard to read.
- **Use anything that requires fine motor skills, such as pop-up menus or click-and-drag operations.** People's fine motor skills wane as they age, making it hard for the elderly to click that little X in the upper right hand corner to close pop-up menus or even to use pull-down menus.
- **Use jargon and legalese.** Use the simplest language possible.
- **Use fancy multimedia, like Flash audio and video.** Downloading this software can be confusing for people who think "plug-ins" are something you put in a bathroom to cover up odors.

—M.L.

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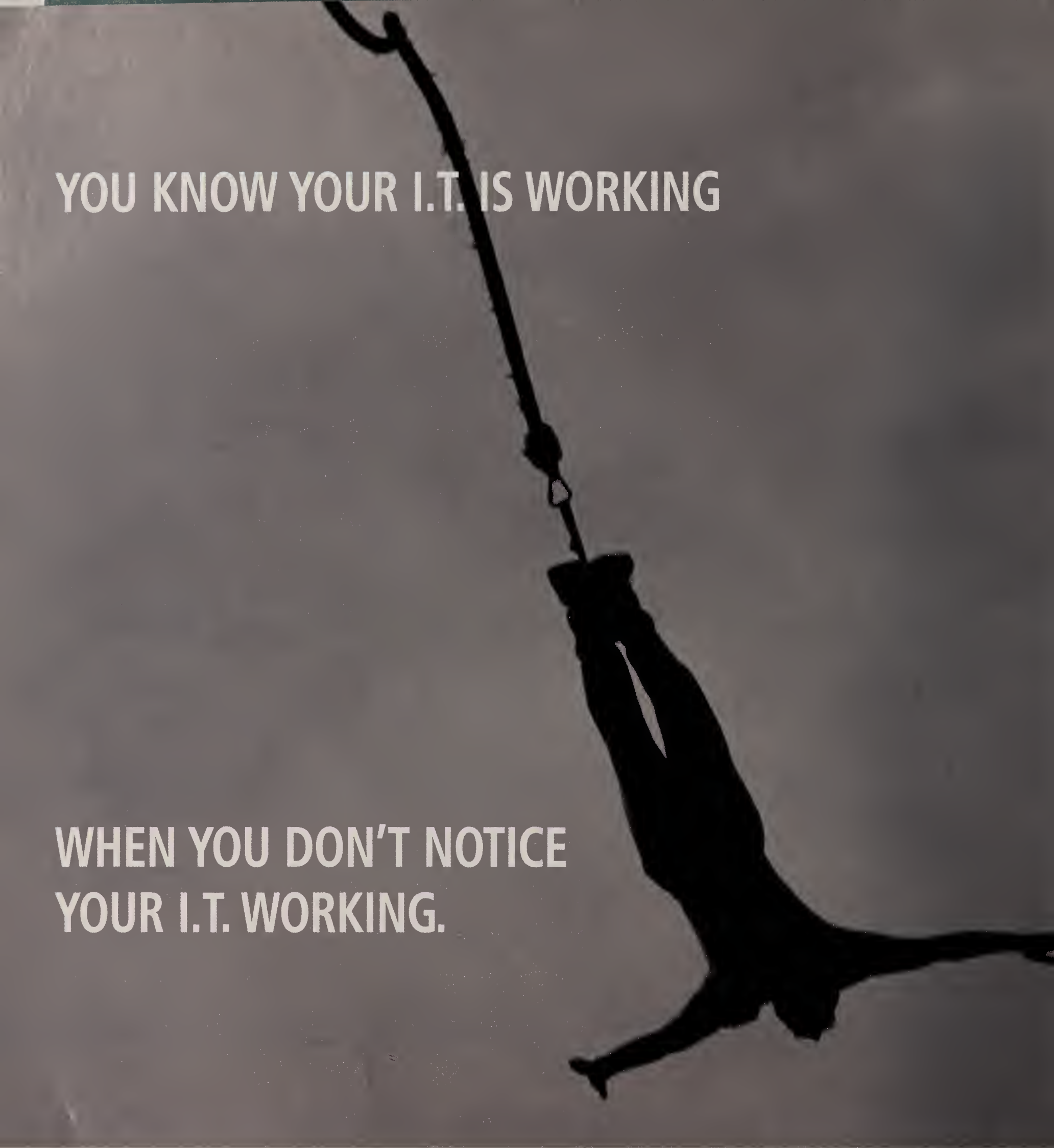


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personas along to meetings. For example, when Maude suggested she would get confused by the process for reordering a prescription and that more reassurance had to be built into the process, Chris would speak up on behalf of users like him to make sure the site wouldn't be so full of explanations that it would slow down the process and alienate computer-savvy users.

have shown up since the redesigned site went live in December 2002. Medco Health has seen a 33 percent increase in the number of transactions and a 26 percent increase in the number of prescriptions ordered online. The number of abandoned shopping carts has decreased by 13 percent. Based on the entire number of logins, the number of e-mails from users to the help desk with

Designers generally opted to build in explanations, knowing that if Maude got confused, she'd leave the site and likely never come back.

When discrepancies between different types of users' needs came up, the designers generally opted to build in the explanations, knowing that if Maude got confused, she'd leave the site and likely never come back. They knew that if folks like Maude could get through the site, so too could the Chris Bell.

HITTING THE BULL'S-EYE

The big payoff came when the finished prototypes were vetted with actual users in a usability testing lab: Designers had to make only minor changes to the pages, most pertaining to language. "Using this method, we consistently find fewer problems that you need to fix after running a usability test," says Goodwin.

And that saves money. "It's a more efficient way to design websites with less iterations and less changes because we know up front what we're designing for," says Caride. "From that, you get savings."

But the really impressive numbers

questions about the site has decreased by 18 percent. In June 2003, ComScore Media Metrix reported that seniors 65 years and older spent more time (approximately 21 minutes) on Medcohealth.com and viewed more pages (approximately 31) in a month than any other health website, including Yahoo Health, MSN Health, Drugstore.com and AARP.com.

"The monetary reward you reap from a more efficient process, you also see in the results," says Caride. "You get savings from an efficient design once, but if you have increasing traffic and loyalty and satisfaction, that just keeps multiplying." **CIO**

Senior Writer Meridith Levinson owns the beat on e-commerce. Send her feedback via e-mail at mlevinson@cio.com.

Learn More About Redesign

To see before and after screen shots of **MEDCOHEALTH.COM'S WEBPAGES**, go to the online version of this story.

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Case Files: Chuck Latham Associates

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WIRELESS SYSTEMS

WIRELESS CONNECTIONS

ORGANIZATION

Chuck Latham Associates

PRINCIPAL BUSINESS

Retail merchandising company

HEADQUARTERS

Parker, Colo.

VALUE PROPOSITION

Latham is using PDAs in place of pen and paper to give its customers quick access to information about in-store displays and promotions, allowing for faster response to problems and opportunities.

THE PLAYERS

CHUCK LATHAM

Owner, Chuck Latham Associates

CASE ANALYST

EUGENE SIGNORINI

Senior Analyst, the Yankee Group

No Frills Wireless

Charged with keeping tabs on retail displays, Chuck Latham Associates turned to PDAs and custom software

BY MICHAEL E. KANELL

ASK ABOUT TECHNOLOGY, and Chuck Latham will describe the places he stumbled, the time and the money he wasted finding out what wouldn't work, and how he learned to take a good thing today while keeping a lookout for something great tomorrow.

At the moment, Chuck Latham Associates, a retail merchandising company, depends on handheld computers. And while the PDAs are far more advanced than the clipboards and pencils with which the company started, Latham has made conscious choices to stay slightly behind the tech curve by avoiding costly wireless and high-end hardware options.

The company gives its customers information they need but are unlikely to have the time or resources to discover for themselves. It gives manufacturers daily reports from the stores that sell their products. Using the data, Latham's customers can find out how well different offerings are selling, whether the store has put the cans or packages on the shelves the manufacturer paid

for, and whether promotional displays are set up correctly.

The service fills a critical function for companies both large and small. A vendor may spend beaucoup bucks designing an eye-catching display. It may pay a tidy sum for great placement in the store. But it all goes to naught if some poorly paid, badly motivated or inadequately supervised stocking clerk doesn't put everything where it should be.

For years, Latham says, the task of tracking displays was strictly low-tech. Now Latham employees roll into a store and head for the customers' products—PDAs in hand. In an average four-hour session, they count cans and packages, they monitor placement, they check displays. And they note it all in the handhelds. Later, they insert a modem into the handheld, plug in the phone line and—with a couple more taps—download the data. In moments, the information is in a server and on a website that is accessible to the manufacturer.



Chuck Latham's company is using its third type of PDA in search of the right data collection device.

EARLY MISCUES

But getting to this point required numerous decisions about what technology to use and how to implement it. In his first foray into the post-clipboard era (about four years ago), Latham started with laptops and Lotus Notes software. But the laptops were expensive, their battery life was short, and they were cumbersome for employees to use in the stores.

Next Latham tried a Palm OS-based Handspring PDA with 16MB of memory

running custom software to synchronize with Notes, but found that the solution was too rigid. Latham's customers needed more than just checks in boxes. They needed descriptions and details of what was going on in the stores, on the shelves, in the stockrooms. The Handspring could hold data from just three stores before the reps would need to run off and download the information.

For a third attempt a little more than two years ago, Latham switched to 200 leased

PDA's running Microsoft's Pocket PC operating system and using Microsoft's SQL Server database in conjunction with tools from Unique Solutions and Extended Systems. Unfortunately, the PDA's proved defective, and it took the vendor three months to repair them. Before the end of that trial, Latham says, he "had everybody writing down the data and faxing it in. I had to hire temps to keypunch it into the database. It was ugly."

FIXING FLAWS

But while the hardware had problems, the software was doing the job. Unique Solutions provides applications for collecting the data, and Extended Systems provides the software that transfers the data between handheld and server. The first round of software from his new partners still had a few flaws, however. Sometimes the data transfer from handheld to server would go slowly. Sometimes data would disappear. But such hiccups are par for the course with new systems. The question always is: How fast do the vendors remove the bugs? In this case, Latham says, his partners answered with the necessary fixes.

Beyond choosing partners, Latham needed to address other choices before the project took off. One of the first was what kind of device to use. Skipping high-end, ruggedized PDA's in favor of \$300 Dell PDA's would allow him to save hundreds of dollars per unit (at the acceptable risk of a few broken units). Insurance on the PDA's was another issue. Getting coverage that would replace any malfunctioning device among his 180 handhelds would run the company about \$12,000 a year. So Latham decided that PDA's such as these don't break *that* often.

EXPERT ANALYSIS

PORTABILITY HELPS THE PROCESS

BY EUGENE SIGNORINI

THE GREATEST BARRIER to enterprise mobile solutions remains the challenge in identifying the business value. Process-oriented functional areas such as field service technicians and supply chain management have become early targets for mobile technologies. In many instances, mobile and wireless computing can increase efficiencies in the work process, and provide measurable improvements for both remote workers and the bottom line.

The mobile implementation at Chuck Latham Associates is one such example of mobile technologies assisting workers in a highly process-oriented function where personnel have to complete tasks quickly while effectively capturing critical customer information.

Once Chuck Latham Associates understood the business value from deploying handhelds to its field reps, it then had to struggle with technology choices. Very often companies grapple with the choice to integrate wireless connectivity into their remote solutions. Chuck Latham Associates correctly made its decision to forgo wireless based on the real-time requirements of the business. In its case, the value of the mobile solution was the efficient and effective capture of information, rather than the instantaneous transfer of that information.

Chuck Latham Associates also appeared hesitant to use wireless network connectivity due to current wireless network limitations and the unique challenges of designing a mobile solution around less than ubiquitous coverage. In reality, wireless networking will never be perfect. But current next-generation wide area networks in the United States on both the GSM/GPRS and CDMA 1xRTT standards provide solid coverage and data throughput in the 20Kbps to 60Kbps range. Additionally, mobile middleware solutions (such as those provided by Chuck Latham's chosen vendor, Extended Systems) can provide session maintenance that lets applications work in disconnected mode when wireless connectivity becomes unavailable.

And while Chuck Latham identified no clear business need to wirelessly transfer information from the store to the clients, the scheduling challenges of its remote salespeople could potentially be addressed by a real-time wireless application. The lesson is that companies should be evaluating the need for wireless based on the real-time requirements, but should also not shy away from wireless computing challenges that currently have viable solutions.

Then there was wireless. While a hot technology, Latham couldn't make the business case for it—at least not yet. Cost was a big factor. The added money for wireless might make sense if his customers needed

real-time updates—and were willing to pay a premium. But they aren't—at least for now. Manufacturers do want up-to-the-minute data, but they don't necessarily need it updated all day, every day.



Eugene Signorini is a senior analyst at the Yankee Group, covering mobile computing and wireless enterprise applications. He can be reached at esignorini@yankeegroup.com.

"We could go in every day, but you could spend your whole day in front of a computer monitor. That's ridiculous," says Willie Wallace, vice president of sales and marketing at Radio Systems, a manufacturer of pet training and containment devices and one of Latham's largest customers. "I'd have to hire a team of people just to watch the data."

Wallace also notes that with real-time data, you could become so flooded with information that you can't move at all. The opposite might also apply: With real-time updates, there is the danger of becoming like an out-of-control day trader—instantly reacting to each shard of information without waiting to get enough of the picture to make a sensible decision.

Still, Latham is looking up the wireless path. He wants eventually to communicate with his field reps through a wireless version of the handhelds. And if the technology does get sufficiently cheap and mature, it could help Latham solve some challenges particular to his business. For example, 70 percent of his employees are part-time. Many are soccer moms—women whose childcare responsibilities limit them to working when school or camp is in session. And because they are covering stores in 42 states and parts of Canada, they pose a special management challenge. The issue is how to get those employees to hit the right places at the right times and get the information back to a central server when the manufacturer is expecting it to arrive. Latham believes that, eventually, the handheld itself will be the tool that lets the company make those arrangements.

But not yet. **CIO**

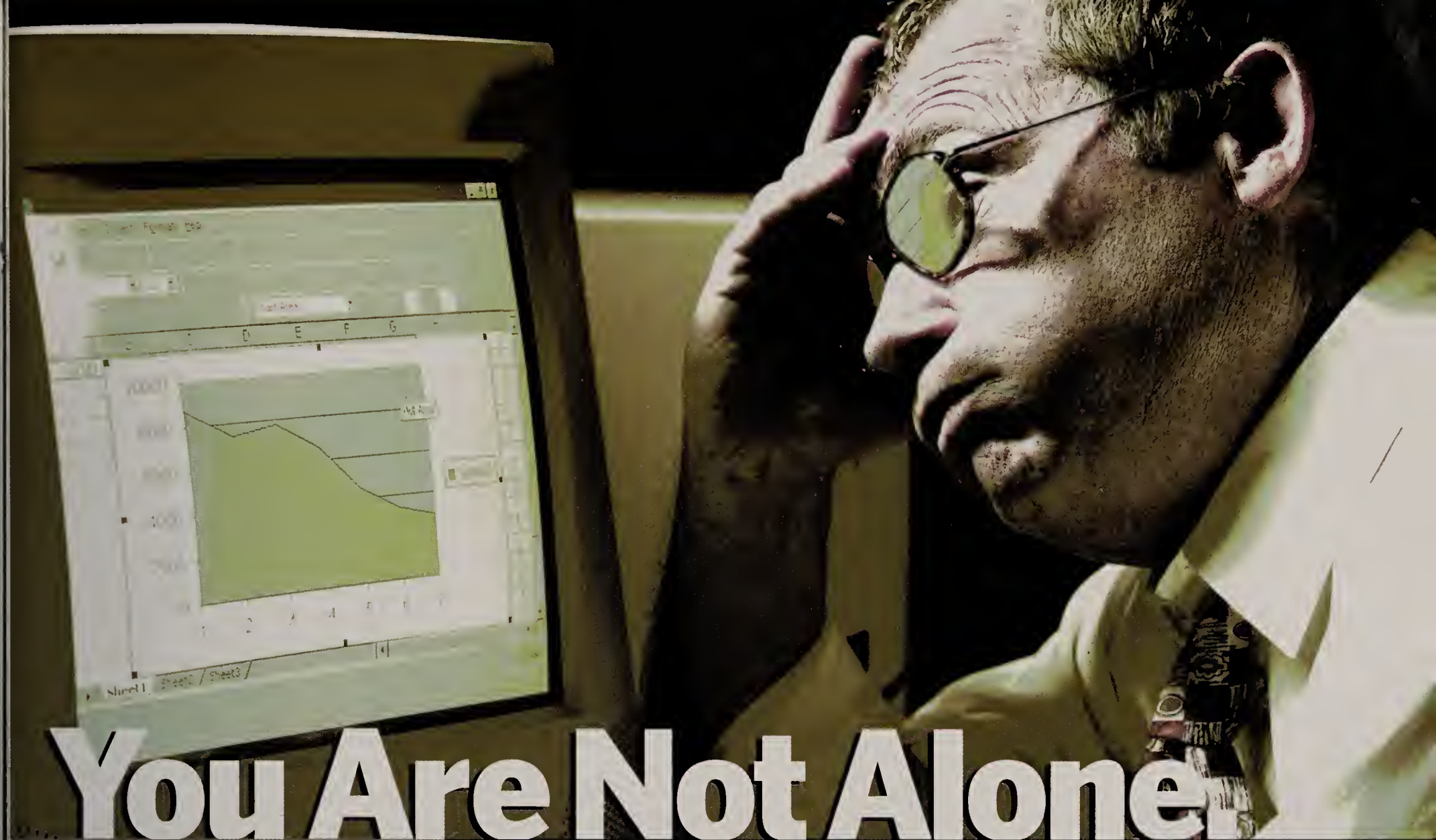
Michael E. Kanell is a business writer for *The Atlanta Journal-Constitution*.

Talk to Eugene Signorini

Got your own questions about wireless and mobile applications and implementations? **ASK THE SOURCE.**

Eugene Signorini, a senior analyst at the Yankee Group who specializes in mobile and wireless enterprise applications, is ready to offer insights. Send your questions until Nov. 30. Go to www.cio.com/ask.

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WHAT CUSTOMERS REALLY WANT IS FOR

BY CLAYTON M. CHRISTENSEN AND MICHAEL E. RAYNOR

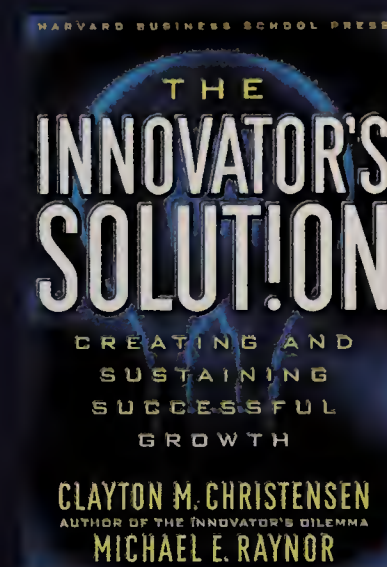
YOU

TO
DO
THEIR
JOBS

To make innovative products that drive growth, companies must forget about demographics, product attributes and market size data, and focus most on the specific jobs customers need to get done

CLAYTON M. CHRISTENSEN, WHO FRAMED THE PROBLEM

The Innovator's Dilemma in 1997, is back again, with coauthor Michael E. Raynor, to offer answers in *The Innovator's Solution*. And with companies waiting expectantly for an economic upsurge and a return to aggressive innovation, the timing of this book may be perfect. In *Dilemma*, Christensen, a Harvard Business School professor, demonstrated that companies tend to reject disruptive ideas—those that don't appeal to established customers or markets—in favor of sure bets with predictable outcomes. In *Solution*, written with Raynor, a director at Deloitte Research, the authors explain what companies should focus on in order to innovate and grow a business. This excerpt from Chapter 3 looks at how conventional customer and market segmentation typi-



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Reader ROI

- ▶ The fundamental flaws of traditional customer and market segmentation
- ▶ Why market opportunity data dooms product launches
- ▶ How a focus on doing jobs for customers can make a product a sustained winner

cally dooms new products to fail. And CIOs should note that IT-derived market data is one of the big culprits. Instead of focusing on product attributes and on market size data, companies must learn what jobs customers want to perform with potential products, and use this as their marketing guidepost.

EXCERPT

All companies face the continual challenge of defining and developing products that customers will scramble to buy. But despite the best efforts of remarkably talented people, most attempts to create successful new products fail. More than 60 percent of all new-product development efforts are scuttled before they ever reach the market. Of the 40 percent that do see the light of day, 40 percent fail to become profitable and are withdrawn from the market. By the time you add it all up, three-quarters of the money spent in

they can “hire” to get the job done. This is how customers experience life. Their thought processes originate with an awareness of needing to get something done, and then they set out to hire something or someone to do the job as effectively, conveniently and inexpensively as possible. The functional, emotional and social dimensions of the jobs that customers need to get done constitute the circumstances in which they buy. In other words, the jobs that customers are trying to get done or the outcomes that they are trying to achieve constitute a circumstance-based

to tumble when managers collectively begin to assume that the customer's world is structured in the same way that the data is aggregated. When managers define market segments along the lines for which data is available rather than the jobs that customers need to get done, it becomes impossible to predict whether a product idea will connect with an important customer job. Using this data to define market segments causes managers to aim innovation at phantom targets. When they frame the customer's world in terms of products, innovators start racing

Customer segmentation (or categorization) should be based on the notion that customers “HIRE” PRODUCTS TO DO SPECIFIC “JOBS.”

product development investments results in products that do not succeed commercially. These development efforts are all launched with the expectation of success, but they seem to flourish or flop in unexpected ways. We argue that the failures are really not random at all: They are predictable—and avoidable—if managers get the market segmentation right.

Only if managers define market segments that correspond to the circumstances in which customers find themselves when making purchasing decisions can they accurately theorize which products will connect with their customers. We believe that customer segmentation (or categorization) should be based on the notion that customers “hire” products to do specific “jobs.” Doing so will help managers segment their markets to mirror the way their customers experience life. This approach can also uncover opportunities for disruptive innovation.

Predictable marketing requires an understanding of the circumstances in which customers buy or use things. Specifically, customers—people and companies—have “jobs” that arise regularly and need to get done. When customers become aware of a job that they need to get done in their lives, they look around for a product or service that

categorization of markets. Companies that target their products at the *circumstances* in which customers find themselves, rather than at the *customers* themselves, are those that can launch predictably successful products. Put another way, the critical unit of analysis is the circumstance and not the customer.

HOW I.T. UNDERMINES THE SUCCESS OF INNOVATION

The IT systems in most companies collect, aggregate and summarize data in various ways to help managers make better decisions. The reports are undoubtedly helpful, but they also lead companies to develop new products and services destined to fail in the marketplace. Almost all corporate IT reports are structured around one of three constructs: products, customers and organizational units. The data shows managers how much of each product is being sold, how profitable each is, which customers are buying which products, and what costs and revenues are associated with servicing each customer. IT systems also report revenues and costs by business units so that managers can measure the success of the organizations for which they have responsibility. The odds of developing successful new products begin

against competitors by proliferating features, functions and flavors of products that mean little to customers. Framing markets in terms of customer demographics, they average across several different jobs that arise in customers' lives and develop one-size-fits-all products that rarely leave most customers fully satisfied. And framing markets in terms of an organization's boundaries further restricts innovators' abilities to develop products that will truly help their customers get the job done perfectly.

Like it or not, although market researchers often develop a solid understanding of the jobs that customers are trying to do, the primary language through which the nature of the opportunity must be described in the resource allocation process is the language of market size. Asking marketers to understand this concept is not the solution to the problem—because whether it is called “marketing myopia” or “jobs to be done,” this concept has been taught before. It is a process problem. Because senior managers typically hire market research to quantify the size of opportunities rather than to understand the customer, the resource allocation process systematically and predictably perverts companies' concept of the structure of their market



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so that it ultimately conforms to the lines along which data is available.

As a result, corporate IT systems and the CIOs who administer them figure among the most important contributors to failure in innovation. Data purchased from external sources has the same impact, because it is structured by product attributes, not by job. The readily available data actually obfuscates the paths to growth.

The solution is not to use data that is collected for historical performance measurement purposes in the processes of new-product development. Keep such data quarantined: It is the wrong data for the job. The size and nature of job-based or circumstance-based market categories actually can be quantified, but this entails a different research process and statistical methodology than is typically employed in most market quantification efforts.

USING CIRCUMSTANCE-BASED SEGMENTATION TO GAIN A DISRUPTIVE FOOTHOLD

The first time that builders of a new-growth business need to assess what the target customers really are trying to get done is when they are searching for the disruptive foothold—the initial product or service that is the point of entry for a new-market disruption. When managers position a disruptive product squarely on a job that a lot of people are trying to get done, and which has been poorly addressed in the past, they create a launchpad for subsequent growth through sustaining innovations that build on the initial platform.

How can managers identify these foothold opportunities? It may never be possible to get every dimension of a product introduction in a new-market disruption right at the outset. We believe, however, that a jobs-to-be-done lens can help innovators come to market with an initial product that is much closer to what customers ultimately will discover that they value. The way to get as close as possible to this target is to develop hypotheses by carefully observing what people seem to be trying to achieve for themselves, and then to ask them about it.

Akio Morita, one of Sony's founders, was

a master at watching what consumers were trying to get done and at marrying those insights with solutions that helped them do the job better. Between 1950 and 1982, Sony successfully built twelve different new-market disruptive growth businesses. These included the original battery-powered

market. Likewise, its Vaio notebook computers are great products, but they too were late entrants into a well-established market.

What caused this abrupt shift in Sony's innovation strategy? In the early 1980s, Morita began to withdraw from active management of the company in order to involve

Corporate IT systems and the CIOs who administer them figure among the most important contributors to FAILURE in INNOVATION.

pocket transistor radio, launched in 1955, and the first portable, solid-state black-and-white television, in 1959. They also included videocassette players; portable video recorders; the now-ubiquitous Walkman, introduced in 1979; and 3.5-inch floppy disk drives, launched in 1981. How did Sony find these foothold applications that yielded such tremendous upside fruit?

Every new-product launch decision during this era was made personally by Morita and a trusted group of about five associates. They searched for disruptive footholds by observing and questioning what people really were trying to get done. They looked for ways that miniaturized, solid-state electronics technology might help a larger population of less-skilled and less-affluent people to accomplish—more conveniently and at less expense—the jobs they were already trying to get done through awkward, unsatisfactory means. Morita and his team had an extraordinary track record in finding these footholds for disruption.

Interestingly, 1981 signaled the end of Sony's disruptive odyssey, and for the next 18 years the company did not launch a single new disruptive growth business. The company continued to be innovative, but its innovations were sustaining in character—they were better products targeted at existing markets. Sony's PlayStation, for example, is a great product, but it was a late entrant into a well-established

himself in Japanese politics. To take his place, Sony began to employ marketers with MBAs to help identify new-growth opportunities. The MBAs brought with them sophisticated, quantitative, attribute-based techniques for segmenting markets and assessing market potential. Although these methods uncovered some underserved opportunities on trajectories of sustaining improvement in established markets, they were weak at synthesizing insights from intuitive observation. In searching for an initial product foothold in new-market disruption, observation and questioning to determine what customers are trying to do, coupled with strategies of rapid development and fast feedback, can greatly improve the probability that a company's products will converge quickly upon a job that people are trying to get done.

INNOVATIONS THAT WILL SUSTAIN THE DISRUPTION

Gaining a foothold is just the first battle in the war. The exciting growth happens when an innovation improves in ways that allow it to displace incumbent offerings. These are sustaining improvements, relative to the initial innovation: improvements that stretch to meet the needs of more and more profitable customers. Choosing the right improvements is critical to the disruptive march up-market. Here again, job-based

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segmentation logic can help.

Let's examine one of the hottest markets of the past decade—handheld wireless electronic devices. The BlackBerry, a handheld wireless e-mail device made by the Canadian company Research in Motion (RIM), is an important competitor in this field. RIM found the BlackBerry's disruptive foothold at a new spot on the third axis in the disruption diagram, competing against non-consumption by bringing the ability to receive and send e-mail to new contexts such as waiting lines, public transit and conference rooms. So what's next? How does RIM sustain the product improvement and growth trajectory for its BlackBerry? Surely, dozens of new ideas are pouring into RIM executives' offices every month for improvements that might be introduced in the next-generation BlackBerry. Which of these ideas should RIM invest in, and which should it

ignore? These are crucial decisions, with hundreds of millions of dollars in profits at stake in a rapidly growing market.

RIM's executives could believe that their market is structured by product categories characterized by some moniker such as "We compete in handheld wireless devices." If so, they will see the BlackBerry as competing against products such as the PalmPilot, Handspring's Treo, Sony's Clié, mobile telephone handsets made by Nokia, Motorola and Samsung, and Microsoft Pocket-PC-based devices such as Compaq's iPaq and Hewlett-Packard's Jornada. In order to get ahead of these competitors, RIM would need to develop better products faster than the competition. Sony's Clié, for example, has a digital camera. Nokia's phones offer not just live conversation and voice messages, but short text messaging as well. The PalmPilot's consummately convenient calendaring, rolodexing and note-keep-

ing features have almost become industry standards. And does the fact that Compaq and Hewlett-Packard offer stripped-down versions of Word and Excel software mean that RIM will be left behind if it does not follow suit?

Defining the market by the characteristics of the product causes managers to think that in order to beat the competition, Research in Motion would need to build some number of these features into its next-generation BlackBerry device. RIM's competitors, of course, would be thinking the same thing—all trying to cram their competitors' superior features into their products in a race to get ahead of the pack. Our worry is that defining market segments in a product-based way actually causes a head-long, arms race-like rush toward undifferentiated, one-size-fits-all products that perform poorly any specific jobs that customers might hire them to do.

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Alternatively, RIM's executives might segment their market in demographic terms—targeting the business traveler, for example—and then add to the BlackBerry those product improvements that would meet those customers' needs. This framing would lead RIM to consider a very different set of innovations. Stripped-down customer relationship management software might be considered essential, because it would allow salespeople to review account histories and order status quickly before contacting customers. Downloadable electronic books and magazines would obviate customers' having

e-mails while waiting in line at airports. When an executive puts an always-on BlackBerry on the table in a meeting, what is she trying to do? Just in case the meeting gets a little slow or boring, she wants to be able to glance through a few messages unobtrusively, just to be a bit more productive. When the pace of the meeting picks up, she can slide the BlackBerry aside and pay attention again.

What is the BlackBerry competing against? What gets hired when people need to be productive in small snippets of time and they don't pick up a BlackBerry? They often pick up a wireless phone. Sometimes they pick up

might help the BlackBerry gain share against boredom. Viewing the market in terms of the jobs that its customers are trying to get done would define for RIM an innovation agenda that is grounded in the way its customers live their lives. The good news for RIM shareholders is that this appears to be the trajectory that the BlackBerry is on.

Doing this make-me-productive-in-small-snippets-of-time job perfectly is not trivial, of course. Adding voice telephony to the BlackBerry would increase power consumption. This, however, is the type of challenge classically associated with sustaining innovation.

The odds of developing successful new products tumble when managers assume that the customer's world is structured in the same way that the data is aggregated—**AROUND PRODUCTS, CUSTOMERS AND ORGANIZATIONAL UNITS.**

to carry bulky reading material in their briefcases. Wireless Internet access, with the attendant capabilities to alter travel reservations, trade stocks and find restaurants via global positioning satellites, could be very appealing. Expense-reporting software coupled with the ability to transmit reports to headquarters wirelessly might be a must.

Every executive who has participated in decisions to define and fund innovation projects will empathize with the tortured difficulty of answering questions such as these. No wonder that many have come to regard innovation as a random crap shoot—or worse, a game of Russian roulette.

But what if RIM structured the segments of this market according to the jobs that people are trying to get done? We've not conducted serious research on this, but just from watching people who pull out their BlackBerrys, it seems to us that most of them are hiring it to help them be productive in small snippets of time that otherwise would be wasted. You see BlackBerry owners reading

The Wall Street Journal. Sometimes they make notes to themselves. Sometimes they stare mindlessly at the CNN Airport Network, or sit with glazed eyes in a boring meeting. From the customer's point of view, these are the BlackBerry's most direct competitors.

What improvements on the basic BlackBerry wireless e-mail platform does this framing of the market imply? Word, Excel and CRM software are probably out—it's just really hard to boot up, shift mental gears, be productive and gear down these activities within a five-minute snippet of time. Snap-on digital cameras likewise aren't likely to be hired to get this job done.

However, wireless telephony is a no-brainer for RIM, because leaving and returning voice messages is another way to be productive in small snippets of time. Financial news headlines and stock quotes would help the BlackBerry compete more effectively against *The Wall Street Journal*. And mindless, single-player games or automatically downloaded David Letterman-like lists of 10

RIM's biggest issue is probably not a lack of engineering talent; it is deciding which problems it should deploy that talent against.

WHO NEEDS A CAMERA IN A MOBILE PHONE?

What should Palm do? In the context of the job that the BlackBerry is hired to do, a camera makes no sense. But might it make sense on a product like the PalmPilot that is used to keep track of people? In addition to just displaying a name card, a camera would enable users to store the person's image as well—helping PalmPilot users be better organized by remembering not just people's names but their faces too.

In the Japanese mobile phone market, the strategies of mobile telephony providers J-Phone and NTT DoCoMo to add a camera and photo viewer to the mobile phone and to provide the data services required to send and receive low-quality digital photos met with instant success in the early 2000s. Why? A few years earlier these firms had created a

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booming new-market disruption selling wireless Internet access through services like DoCoMo's I-Mode. Their customers were primarily teenagers, who had hired mobile access to the Internet in order to have fun with their friends downloading wallpaper and ring tones. The popularity of limited-functionality cameras and photo viewers on these teenagers' phones makes sense when viewed through the lens of jobs to be done: Mobile phones that send and receive photos offer these young people more and newer kinds of fun.

Should European and North American service and handset providers attempt to emulate this success by incorporating this functionality in their phones? At this writing, we expect camera-equipped phones to take off much more slowly in these markets because many mobile phone users in these markets are adults who seem to have hired mobile phones to get work done or exchange important information in small snippets of time. Cameras and viewers rarely help get these jobs done better. If these companies were to market phones and these services to teenagers and children as a new way to have fun by taking and transmitting images, this product feature could create substantial growth. But if they follow their demonstrated propensity to deploy the functionality as a high-priced feature on phones that serious multitasking adults have hired to get down to business rather than play, our bet is that little growth will result.

If RIM evolved the BlackBerry to help people be evermore productive in small snippets of time, if Palm evolved its Pilot to help people be ever better organized, and if J-Phone's handsets were optimized to help teenagers have fun, the products would become quite differentiated in consumers'

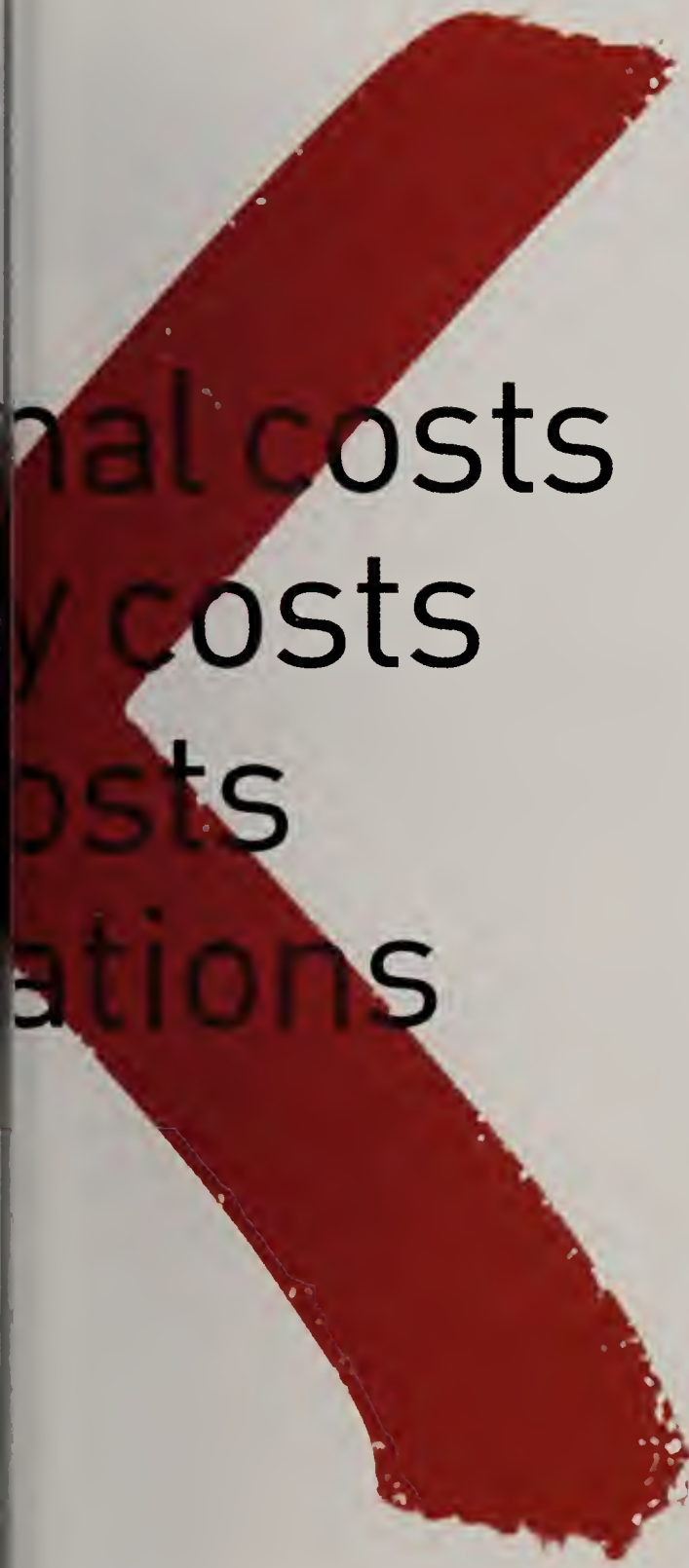
Learn More About Innovation

After publishing **The Innovator's Dilemma** and before publishing **The Innovator's Solution**, **CLAYTON CHRISTENSEN** talked with *CIO* about his research. To read "Disruption Is Good," go to www.cio.com/printlinks.

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minds—and each could grow to own a large market share of its respective job. And because these different jobs arise at different points in time and space in consumers' lives, we'd bet that for a very long time most consumers would opt to own each product individually rather than having a single, Swiss Army knife-like device—that is, until a one-size-fits-all device can do all these jobs without compromising functionality, simplicity and convenience.

Unfortunately, it appears that many manufacturers in this space are now on a collision course. Each seems bent on packing every other competitor's functionality into a single, all-purpose device. Unchecked, this will lead to commoditized, undifferentiated products that don't do really well any of the jobs that they once got hired to do. This need not be so. The suicidal trajectory results from framing the market in terms of the attributes of products and the attributes of customers, rather than in terms of jobs to be done.

SUMMING UP

Identifying disruptive footholds for products means connecting with specific jobs that people—your future customers—are trying to get done in their lives. The problem is that in an attempt to build convincing business cases for new products, managers are compelled to quantify the opportunities they perceive, and the data available to do this is typically cast in terms of product attributes or the demographic and psychographic profiles of a given population of potential consumers. This mismatch between the true needs of consumers and the data that shapes most product development efforts leads most companies to aim their innovations at nonexistent targets. The importance of identifying these jobs to be done goes beyond simply finding a foothold for a new product. Only by staying connected with a given job as improvements are made, and by creating a purpose for your brand so that customers know what to hire, can a disruptive product stay on its growth trajectory. 

Reality Bytes

A Cold Look at Hot Trends

When (or if) the Boomers Say Bye-Bye

Conventional wisdom holds that the mass retirement of the baby boomers will trigger a hiring frenzy. Conventional wisdom is wrong.

BY MEGAN SANTOSUS

TRYING TO READ the economy's tea leaves has been an extended exercise in frustration. On any given day, leading economic indicators—be they manufacturing orders, new housing starts or retail sales—may signal an upswing only to be confounded the very next day by sluggish corporate profits and a rise in the number of layoffs. It's enough to give the army of displaced IT workers apoplexy.

While all that the short term offers is conflicting signs, conventional wisdom holds that in the long run there's a built-in solution to chronic unemployment: During the next five to 10 years, millions of baby boomers will be retiring, essentially heading for the exits en masse. This exodus will create a demographically driven worker shortage that will put the power back into the hands of the job seekers. That means that today's workers will eventually be able to say good-bye to static or shrinking paychecks, and that today's unemployed can look for an end to all that pavement pounding.

For job seekers, it will be back to a future of multiple job offers at 25 percent more than their previous salary.

For corporate managers, it will be a nightmare.



Preparing for the Hiring Frenzy—Not

The folks advancing this argument say that hiring managers better get hip to the shortage scenario. In fact, they say, those who aren't currently planning for the coming hiring frenzy may be putting their enterprises permanently behind the proverbial eight ball.

Others think this is all a load of hooey.

Peter Cappelli, a management professor and the director of the Center for Human Resources at The Wharton School, conducted research that questioned these assumptions about the potential economic impact of an aging employee population. Cappelli found that any projected labor shortage caused by retiring boomers is, in fact, a complete fiction. True, the generation following the boomers—the so-called baby busters—is about 16 percent smaller than its predecessor, but with an average age of 30, the busters, who already

ILLUSTRATION BY ALEX NABAUM

Suddenly the possibilities are _____.

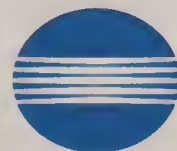


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have been in the workforce for a number of years, won't be retiring anytime soon and are both willing and, more important, able to fill any voids left by the departing boomers. Add to that the fact that the generation after the busters is composed of the boomers' offspring and is therefore relatively large, and that many members of that generation are currently in college and will be looking for work in a few years. Putting all that together, Cappelli concludes that the future pool of skilled employees—the kind most in demand by employers—promises to be more than adequate for businesses' needs.

Finally, Cappelli finds a flaw in the proposition that retirement will soon beckon legions to abandon the workforce.

Many companies are fixated on the idea of a manpower shortage and thus will spend precious time, energy and resources solving the wrong problem. The real challenge—retaining the workers you already have—will likely go unaddressed.

Given the lousy state of retirement accounts, coupled with increased life spans, it's unlikely that everyone who turns 65 will be decamping for that gated community in Florida. And even many who *can* afford to retire will choose not to, although they may change jobs or cut back on their work schedules.

"Yes, there's the potential for a lot of people to retire all at once, but there have been few cases where it actually happens," Cappelli says, adding that the auto industry and government agencies are the most likely sectors to experience widespread retirements. In that scenario, Cappelli says the most pressing issue won't necessarily be finding workers as much as preserving the knowledge of those who are leaving. "Organizations should be examining now if they have the capability to retain some of the knowledge," he says. "If they are paying any kind of attention, they should be able to do that."

In short, don't look for tomorrow's population trends to provide a solution to today's unemployment problem. "Demographics, which change slowly and predictably, aren't going to cause a labor shortage," Cappelli says.

That's not to say there won't be a labor shortage sometime in the future. But if there is one, it will be a labor shortage caused by increase in business activity—and good luck trying to predict that.

Not a Labor Shortage, a Knowledge Shortage

So if there's not going to be a labor shortage based on demographic shifts, what's the problem? As Cappelli sees it, many companies are fixated on the idea of a manpower shortage and thus will spend precious time, energy and resources solving the wrong problem. The real challenge—retaining the workers you already have—will likely go unaddressed. According to Cappelli, the employment boom that occurred in the late '90s was in actuality a retention issue in disguise. "A couple of years ago, all sorts of companies were hiring like crazy and weren't able to meet their business demands," he says. "The thought was that the problem was an inability to find enough people, but companies were losing people out the backdoor as quickly as they were hiring in the front door."

In effect, companies were paying a tax on two fronts: They paid to hire and train new employees; and they paid for the loss of experience and knowledge.

Ironically, IT is one of the professions that historically has been most at the mercy of demographics because employers have focused on hiring people right out of college. So if Cappelli's theory is right, is there any hope for a rebound in IT employment? Unfortunately, the answer isn't clear-cut. In light of the trend toward

the global outsourcing of IT work, companies may not believe they need to fret about retaining skilled workers because the pool of available labor is now a worldwide one.

"The ability to outsource work outside the U.S. gives employers a safety valve," notes Cappelli. "They don't have to find or retain the workers here; they can just move the work to where the workers are." Cappelli prefers to keep his own counsel on whether the millions of IT jobs sent abroad will ever return or whether millions more are destined to go the same way. What that question comes down to is flexibility versus control. If companies want the former, they'll continue to ship work and jobs offshore; if they want the latter, IT jobs will stay put and, perhaps, even return.

The notion of a worker shortage based on aging boomers and flagging birth rates is a seductive one because it's quantifiable and lifts the responsibility for the future from our already overburdened shoulders. After all, you can't fight demographic trends. *Que sera, sera*, as it were. But as Cappelli reminds us, assuming that the future is out of our control just about guarantees that it will be. **CIO**

Opinion and Knowledge Management Editor Megan Santosus always defies the conventional wisdom. She may be reached at santosus@cio.com.



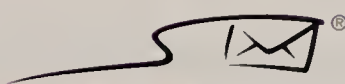
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Career Counsel

Expert Advice to Aspiring CIOs and IT Managers

Follow the Money

If you want to be a CIO, it doesn't hurt to have a little CFO in you

Q: Recently, the CFO of our company asked me if I would like to accept a position in our accounting department. The responsibilities are not yet known. I currently have more than 20 years of experience in IT, ranging from IBM systems programming to management of IT infrastructure (mainframe, midrange, NT, telephony, voice and data network, security, and so on). I have applications experience in implementing SAP and PeopleSoft. My background is well rounded in operations, applications and management. Would a move into a user area of accounting help or hinder my desire to become a CIO?

A: I think a move into accounting can be helpful to your pursuit of a CIO role, provided you are given substantial responsibilities that include project management. Since IT and finance are so tightly aligned in companies, you will no doubt increase your knowledge and understanding of how your company works, and you will develop additional business relationships. More and more, CIOs today have had prior stints in business management; therefore, being knowledgeable and conversant in a core business function is a plus as you compete for the CIO role in the marketplace.

—Beverly Lieberman,
president of Halbrecht Lieberman Associates



WHAT ARE THEY SAYING?

Q: I recently took over the director of finance role for the e-commerce division of a Fortune 500 retailer. I have an investment banking background and have very limited exposure to technology.

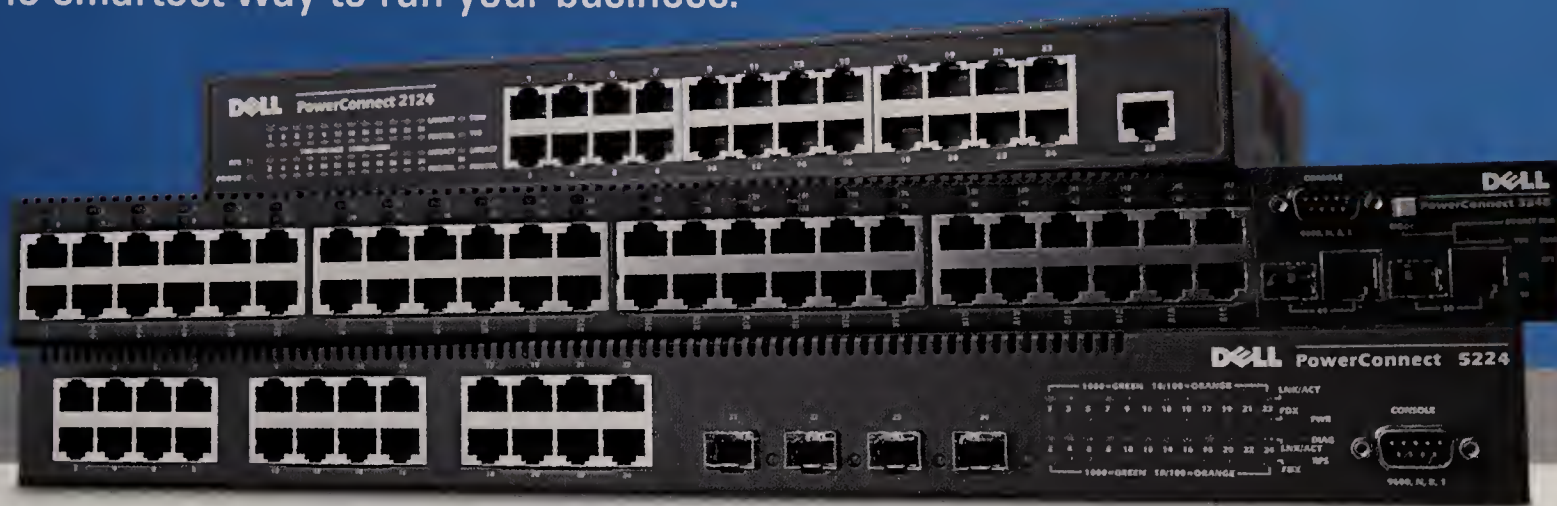
We clearly treat IS as a siloed cost center. I see this as an opportunity worth improving. I've reached out to my counterpart in IS but feel like we are two people with a common goal speaking different languages. Are there any "technology for nontechnology managers" books, courses or seminars to help me bridge this gap?

A: Trying to understand the "technospeak" of information technology can be a challenge for new folks like you who are just recently exposed to the field. I suggest looking into specialty areas, such as software, networking, infrastructure, architecture and operations, all of which have associated member

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organizations, publications and newsletters. In addition, many industries have IT publications and associations focused exclusively on their particular needs—retail is one of them. Approach your CIO and find out what retail and IT-related publications he would recommend to help you get up to speed.

Also, to get a good general management perspective, consider approaching some of the IT research companies such as Gartner and Meta Group, two industry watchdogs that conduct in-depth research on products, services and trends.

—Gerry McNamara, partner of Heidrick & Struggles

Editor's note: Two of our online resources may be of some help—CIO.com's Executive Summaries (www.cio.com/summaries) for fast insight into complicated subjects and our sister publication Darwinmag.com, which aims to explain technology to the non-technology executive.

THE TECHNOLOGY GAP

Q: I have 10 years of business experience in a top investment banking company. The past four years have been primarily directed toward establishing a departmentwide technology strategy, building a Web development team and implementing a global data warehouse. I have an MBA from a top-20 school.

Since IT and finance are so tightly aligned, having experience in both areas will no doubt increase your knowledge and understanding of how your company works.

I am looking to move into a CIO role in the next three to five years. Recruiters tell me they like my background but think I need more technical experience. Given my background, is it better for me to focus my work experience on technology areas or pursue a master's in MIS, or both?

A: I believe you have the best educational credential you need to be successful as a CIO. Your top-ranked MBA says that you are a bright, business-focused individual. An additional postgraduate degree is unnecessary; you would be better served by using available time to attend seminars and conferences oriented toward topical concepts and practical applications of technology. Regarding your experience going forward, the advice given to you by recruiters implies that you did not come up through the technical ranks of programming and systems. If that's the case, you should spend time in rota-

tional assignments to gain firsthand exposure—in a leadership role, not technical—to those facets of the IT function you have not yet had a chance to experience. In that way, you can round out your exposure in preparation for that CIO position.

—Mark Polansky, managing director and member of the advanced technology practice at Korn/Ferry International

REWARDING VERSUS REWARDS

Q: I am contemplating taking an IS director position in a school system. If I go into the educational field, will I be able to jump back into the private sector? What challenges are there in the educational field from an IS perspective?

A: A move into the educational field can be rewarding. However, the budget constraints, especially in the public school system, can be limiting in terms of IT investment. If you are highly motivated to make this change, I believe you will be able to move back into the private sector after a few years, provided that what you have been doing for the school system is mainstream in nature and will translate into the business world's problem-solving needs. —B.L.

TOO LATE TO MOVE?

Q: I have 15 years of experience, including 10 in manufacturing. About five years ago, I made the switch into IT. Since then I have

been managing various application development groups. I have an engineering background and an MBA. Where do I go from here? I like IT, but am I starting my career all over? What are the basics I should be putting in my toolbox to be a CIO someday?

A: It clearly sounds like you are on the right track. You essentially started a new career path five years ago when you combined new applications development skills with your experience in manufacturing. Additionally, your academic credentials of an engineering baccalaureate and an MBA are ideal, especially in a manufacturing company. Going forward, you should seek out projects within the applications development function that round out your business exposure, be it in finance, sales and marketing, value chain or operations. Also pursue assignments and opportunities to get significant exposure to infrastructure and networking as well as additional leadership experience in resource management, budgeting, portfolio management, IT governance and the like. And at the highest level, keep an eye focused on "The Top Ten" attributes (find the link at

www.cio.com/printlinks) that my clients look for in CIO candidates. —M.P. 

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The Web-based Executive Career Counsel column is edited by Director of Online Research Kathleen Kotwica (kkotwica@cio.com).

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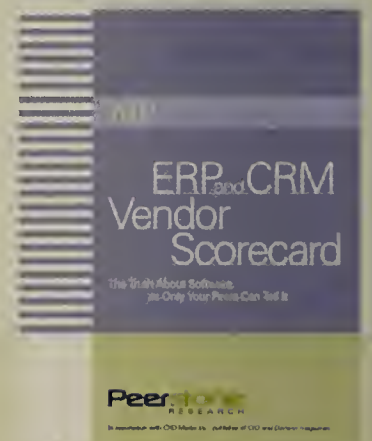
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TECHNOLOGY

Edited by
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From Inception to Implementation—**IT That Matters**



Server-based computing is old news, but users find new reasons to keep it around

Remote Possibilities

BY TODD DATZ

MOBILE COMPUTING | CIOs face a double-edged sword when it comes to remote access. The good: Workers enjoy the benefits of telecommuting from their homes and staying connected while on the road. The bad: Security can be compromised as data and applications live on lightly protected remote machines, help desks can get swamped, and new applications or updates can require IT staffs to download applications to hundreds or thousands of individual PCs.

One way CIOs have eased the headaches is through server-based computing (SBC). Instead of sitting on laptops or PDAs, applications reside on servers. Users can connect securely to those apps via any device, and when an application needs updating, IT staffers need only do so on the server. In addition, apps don't need to be rewritten to work with particular devices—a nice dose of pain relief given the complex legacy environments existing in many companies.

There are potential cost benefits to SBC as well. "Some of the key ones are reduced support costs for the applications that are deployed, fewer and shorter help desk calls, and potentially a reduced number of desktop visits," says David Friedlander, an analyst at Forrester Research.

ILLUSTRATIONS BY ALEX WILLIAMSON

Legacy Leader

The 800-pound gorilla in the SBC space is Citrix, which owns close to 75 percent of the virtual user interface software market, according to IDC (a sister company to *CIO*'s publisher). Citrix was founded in 1989 by a group of IBM developers who had worked on OS/2. Their goal was to let multiple users gain access to the operating system from multiple devices, mainly Unix servers. When the Internet started to take off in the mid-1990s, however, CIOs started deploying Citrix software to secure access for their mobile users and to provide a greater degree of application centralization.

For years Citrix has been a one-product company, milking its cash-cow MetaFrame software and its partnership with Microsoft. The backbone of the product line is the MetaFrame XP Presentation Server, which works with Windows 2000 and 2003 servers and lets workers access applications using any device, including machines running Unix, Macintosh and Linux operating systems. That's nice for cash-strapped organizations that may not have the budgets to buy new computers—SBC software like Citrix can run on knuckle-dragging Intel 386 processors as well as the latest Pentiums. Another benefit is that it works in heterogenous environments. "The mainframe is still not dead and never will be. Client/server isn't dead—Web-based applications haven't killed it off. And Web services won't destroy everything before that," says Bob Kruger, senior vice president of product development and CTO at Citrix.

After installing MetaFrame, application performance increased by 300 percent, calls to the help desk fell in length and number, and telecom costs dropped.

The company calls its network protocol independent computing architecture (ICA). It consumes approximately 5Kbps to 10Kbps of network bandwidth and can run on connections as slow as 14.4Kbps. The application the

Low Price, High Security

Citrix owns most of the server-based computing market. Tarantella and Microsoft mop up much of the rest. But there are a couple more unusual remote access options IT departments can consider.

For remote terminal access on the cheap, there's the Linux Terminal Server Project. The project began as a successful consulting job and matured into a movement among a small group of Linux programmers who felt the world needed an alternative to high-priced hardware and software upgrades. Users of the freely downloadable product get remote access to a full-featured Linux server, allowing them to run both Linux and Windows applications (the latter through Windows emulation software).

ClearCube, meanwhile, takes a more radical approach to remote access. The company, founded in 1997 by Andrew Heller and current CTO Barry Thornton, set out to reinvent desktop computing. Instead of moving the applications to servers and having remote PCs connect to them, ClearCube moves the entire PC to a central location, leaving little more than a monitor, a mouse and a keyboard on a user's desk.

The PCs are housed in blades—super-slim computers that hold all the components of an entire PC. The blades live in a cage—a centralized, stackable chassis. A C-port (command port), about the size of a VHS tape, then connects keyboard, mouse and monitor back to the cage and blades. With blades, a software upgrade for a couple hundred users easily becomes an overnight project, says ClearCube CTO Thornton. And, if a blade fails, ClearCube's Switch Manager feature notifies IS via e-mail that a blade is down and allows an IT manager to switch a user to a spare blade.

The systems also solve some other tricky problems. Guy Fuller, information systems manager of Northwest Memorial Physicians Group of Chicago, uses ClearCube systems to avoid bringing noise and heat into his medical exam rooms, for instance. As an added benefit, if a blade goes down, it can be switched outside the exam room, without interrupting patient or doctor. —T.D.

user sees appears as if it's running locally, but the only thing being sent over the wire are keystrokes, mouse clicks and screen updates.

Maritz Travel, a global group and corporate travel company, has been using MetaFrame software since 1998. Mobile connectivity was

at the right time, get them to the right rooms and so on. However, it often took them four hours to download the old application over a dial-up connection, and screen-to-screen response time was sluggish. "It got to the point where we almost refused to use the application and were putting things on paper," says Richard Spradling, CIO of Maritz.

After installing MetaFrame, application performance increased by 300 percent, calls to the help desk fell in length and number, and telecom costs dropped. The productivity of the travel directors increased as well. Spradling also began installing the software at the company's business travel reservations centers, many of which are in corporate locations. "We'd have an application server, a database server, maybe an Exchange server, and 10 workstations at a client location," he says, adding that in some cases he was even forced to install servers at sites with just a single user. He began implementing the MetaFrame software

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in the smaller offices, replacing the apps on the PCs with thin clients and doing away with the onsite servers. "We really only need a router and thin clients," he says. So far the software has been installed in 25 offices out of 100; Spradling says his staff will roll it out to about 25 more in the next year (but won't do it at the larger offices, which have local tech support and provide backup for business continuity reasons). "I can't say we've saved money from a hardware perspective, but it's easier to maintain, and [apps] are better performing at remote locations," he says.

Spradling points out that his company put software through rigorous usability and performance testing to make sure that there's nothing inherent in applications that cause them to function poorly in a Citrix environment. "We've had browser-based apps that work great when deployed locally, but when deployed across Citrix, we would see a deterioration in performance," he adds, noting that things that cause a screen to change a lot—

But while Citrix still publicly touts Microsoft as an important partner, observers say Citrix execs would be naive if they weren't watching their backs. "You could say the two are competing, you could say they're cooperating, you could say Microsoft is increasing what it feels is its business," says Dan Kusnetzky, vice president of system software research at IDC. Most analysts don't view Microsoft as a threat in heterogeneous, highly distributed environments, however. And Friedlander says, "As long as Citrix can drive growth in the market, declining market share relative to Microsoft isn't a problem, as long as the growth is outpacing that."

Tarantella, like Citrix, offers access to Windows, AS/400, Unix, Linux, Java as well as mainframe applications. When asked how he differentiates his product from Citrix, CEO Doug Michels notes that "Citrix is a good product, but we think it's very centered on Windows applications. Where we win is when the customer has a heterogeneous architecture."

"With Tarantella, a 133MHz Pentium machine can become a brand-new Pentium machine."

—Richard Daddio, assistant superintendent for business and technology services, East Williston school district

flashing dots, for example—are a problem. In those cases, his team will modify an app.

Some of Spradling's application developers are currently piloting MetaFrame using wireless devices. The plan is for the company's travel directors to perform their job—identify which travelers have arrived, move people from one session to another, for example—using PDAs instead of laptops.

Other Players

Microsoft and Citrix have been partners for a long time. Microsoft's latest offering, the Terminal Server component of Windows Server 2003 (which incorporates Citrix technology), virtualizes Windows-based apps to a variety of computing devices, including those that can't run Windows.

The company recently acquired a competitor, software developer New Moon Systems, which will help it expand its market to small and midsize businesses.

Richard Daddio, the assistant superintendent for business and technology services for the East Williston school district in Long Island, N.Y., is a typical school administrator—that is, he continually worries about providing ever-more costly technology services, such as new classroom computers and multimedia software, with limited funds. At his previous district (Bellmore), he found some relief with Tarantella's Enterprise remote access product. "I [had] 485 desktops in the district. For me to go to each desktop and update them to the latest version of Office would be very time-consuming and costly.... It's far easier for us,

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Number of U.S. employees who worked from home during business hours at least one day per month has doubled:

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and a greater cost savings, to deploy through Tarantella." The system has also saved on hardware costs. "We can't turn around computers every three years; some computers are 5, 6, 7 years old. With Tarantella, a 133[MHz] Pentium machine can become a brand-new Pentium machine," he says.

The Bellmore district currently uses (or has plans to use) Tarantella to deploy Microsoft Office, a grade reporting app and other software. Students, teachers and district employees access the applications internally through a WAN and externally via an Internet connection. Daddio looked at Citrix but chose Tarantella based on price. "It was about 50 percent less for the same functionality," he says. Daddio says that he is currently investigating Tarantella for his new district as well.

However, Tarantella is having trouble getting its message out to the masses. "It's an excellent product, but there aren't necessarily a large number of people that know that," Kusnetzky says. "If it can ramp up its marketing, it has a chance [to be around] for a long time. But if it continues down the path it's on—the path being that it's largely an obscure company—that obscurity could kill them."

Vendors Look for Growth

Like many in the tech sector, SBC companies have taken a hit as CIOs have stopped their

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once freewheeling spending habits. Revenue was lower in 2002 than 2001 for SBC software vendors as companies stopped buying new systems and looked to utilize their current assets. But slashed tech budgets haven't been the only damper on growth in this space. Kusnetzky says that none of these vendors has been able to convince IT decision-makers that its products make sense. "[The products are] somewhat technical, and IT decision-makers are increasingly businesspeople, not technologists," he says, adding that SBC vendors need to better lay out the business case for their software, which, he adds, is good technology.

Kusnetzky also points out that the technology—as a standalone product—currently has a window of opportunity that may close in the future. There are three reasons: First, apps are increasingly becoming Web-centric; second, those capabilities could begin to appear in application virtualization environments like BEA or WebSphere; and third, operating systems, such as Terminal Server, which is bundled into Microsoft Server, could also begin (or continue to) incorporate SBC capabilities.

Citrix has recognized the danger of continuing down its standalone product path and now offers MetaFrame Access Suite in an attempt to diversify its revenue stream. That includes Secure Access Manager, which provides secure sockets layer and transport layer security (SSL/TLS) access to Web apps without the need for a VPN; Password Manager, which allows single sign-on for apps running on Citrix; Conferencing Manager, a collaboration tool that allows people in different locations to share apps; and MetaFrame Presentation Server. Tarantella, meanwhile, hopes its acquisition of New Moon will give it a revenue boost.

For CIOs, there are solid reasons to consider SBC products. They can lower hardware, software and support costs, and provide secure access to applications. But for the vendors in this space, patience—and aggressive marketing around business value—will continue to be a virtue as they wait for that often-forecast, never-arriving uptick in tech spending.

Send feedback to Senior Editor Todd Datz via e-mail at tdatz@cio.com.



Next on the Menu: A New SCSI Standard

STORAGE | Previous advances in small computer system interface (SCSI) technology have often been yawners for all but the purest storage aficionados: a little bandwidth boost here, a few extra gigabytes there, a tad more performance every now and again. But in 2004, a new SCSI standard, called Serial Attached SCSI (SAS), promises to take the venerable storage technology to a new level—or at least empty some systems of all that cable clutter.

SAS replaces old-style, inches-wide wire ribbons with thin connectors, similar in size to an Ethernet cable. The obvious benefit to the new design is improved airflow through ever-shrinking system enclosures. But the slim pathway doesn't mean reduced performance. The new standard supports throughputs of 300MBps (similar to Ultra320 SCSI's 320MBps) with plans for 600MBps capability waiting for an update to the spec next year. Reduced connector size will allow for far smaller drives, suitable for server blades and other

tight quarters, such as laptops.

One of the most interesting new additions will be SAS's compatibility with Serial ATA drives. SATA drives are currently available but offer lesser performance and reliability compared with SCSI. They are, however, significantly less expensive per gigabyte. Upcoming SAS adapters will let users add SATA drives to an SAS system to match their storage needs. Using one adapter, a server could contain a few dozen SAS drives for the most critical data and another collection of lower-cost SATA drives for backup, archive and less critical uses, with the adapter automatically determining what type of drive is attached (SATA adapters, however, will not do the same thing for SAS drives).

The SAS specification was slated for final approval by the T10 group of the International Committee for Information Technology Standards before the end of 2003. Products based on the standard are expected to ship by the middle of next year.

—Christopher Lindquist



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Lights Out

BY ERIC KNORR

Do catastrophic power failures have something to teach us about keeping the data center up and running?

UTILITY COMPUTING | Utility computing, a grand concept endorsed by every big tech company, is one of those rare futuristic ideas that enjoys an aura of inevitability. Once the big pipe reaches everywhere, why not pay for computing power as you need it rather than building your own high-maintenance data center? Makes sense to me.

At least it did, until the lights went out from Ohio to New York a few months ago. If all computing power were woven together into a massive grid and a disaster the scale of August's blackout occurred, I'd want my old laptop back in a hurry.

Widely deployed utility computing is decades away, but some data centers are already starting to embrace utilitylike principles, preventing and fielding failures of individual systems as they attempt to keep the whole infrastructure intact. So I wondered: Are there any cautionary lessons to be learned from big blackouts that we can use to help avoid massive data center failure?

Live and Learn

To answer that question, I called up Ric Telford, IBM's director of autonomic computing. First, some necessary nomenclature: "Autonomic computing" is an IBM phrase that refers to systems of any scale that self-configure, self-heal, self-optimize and self-protect. Grid computing, on the other hand, can be defined as a wide-area cluster (which can be autonomic or not).

Both autonomic and grid computing are *enablers* of utility computing: If you can't get scalable computing power over the wire reliably, you're not going to pay for it.

At any rate, Telford indulged my metaphor and even expanded on it. "The analogy in computing systems is Web traffic," he says. "You think about 9/11, you think about recent history when there were huge changes in the influx of traffic, and a lot of sites that prided themselves on being highly responsive to this kind of workload fluctuation failed." And handling traffic and power spikes requires similar preventative measures.

"What the power grid needed was what we're saying computing systems need: the ability to be both self-protecting to prevent failures from occurring in the first place and to be self-healing, which is the ability to correct those failures when they occur," Telford says. According to Telford, self-protection in this context means that "you reach a point where a system can no longer optimize, the point where you're at the edge of failure—where you can't handle the spike. What can you do to prevent your whole system from going down?" Part of the answer, he says, is having an embedded routine that abandons normal attempts to optimize and devotes all resources just to keeping the system running. By contrast, the power companies' self-protecting mechanism "was somewhat drastic—an automatic shutoff."

Problematic systems should be isolated to prevent the kind of domino effect that doused the lights on millions of people.

—Eric Knorr

When failure does occur, self-healing should kick in. "That didn't come across as something the power grid did very well either," Telford says. "Once a particular node went down, what was the problem with it just being able to bring itself back up again?" Problematic systems, however, should be isolated. "If a failure occurs in a database, and an application is dependent on that database, there's no sense in keeping that application running if you know the database is down. It's just going to potentially ripple more failure," says Telford.

The analogy between a data center (or a vast future network of data centers powering utility-based computing) and the power grid is imperfect at best. But Telford agrees that there are lessons IT can learn from catastrophes on both fronts. "At every interconnect," he says, "a CTO should be asking himself: What are we doing to ensure that failure doesn't cascade across the whole system? Are the components of our systems self-protecting? It shouldn't be: 'Gee, it's self-protecting—as long as you don't do this.'"

Eric Knorr (eknorr@pacbell.net) is a freelance technology writer based in San Francisco.

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how they make money—is a critical strategic decision. Understanding what business models are used, how they are combined, and which are most successful

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In response to strong interest in last year's session on IT governance, Weill leads a workshop on how top performers govern. He presents case studies and insights from MIT CISR's study of effective IT governance in 256 enterprises in 23 countries. A framework is presented in this workshop to analyze and communicate governance, illustrated with cases studies of top performers.

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Index of Companies and Advertisers

Page numbers refer to the first page of the article(s) in which the company has a substantial mention. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

COMPANY INDEX

AMR Research Inc. 64
B&T Solutions 32
Baan 64
Bell Helicopter Textron Inc. . 86
Boeing Co., The 32
British American Tobacco PLC 64
Cap Gemini Ernst & Young . 64
Cessna Aircraft Co. 86
Chuck Latham Associates Inc. 104
Citrix Systems Inc. 129
ClearCube Technology Inc. . 129
ComScore Media Metrix . . 96
Concours Group, The 86
Cooper 96
Dell Inc. 104
Ensco International Inc. . . 64
Esseite 64
Extended Systems 104
E-Z-Go Textron 86
Forrester Research Inc. . 96, 129
Gartner Inc. 86
General Motors Corp. . . . 32
Getty Images Inc. 32
Hackett Group, The . . . 64, 86
Hewlett-Packard Co. 32
Holly Corp. 64
Human Factors International Inc. 96

IBM Corp. 129
Intel Corp. 129
J.D. Edwards & Co. 64
Jacobsen 86
JetBlue Airways Corp. . . . 32
Lawson Software Inc. 64
Maritz Inc. 129
Medco Health Solutions Inc. 96
Microsoft Corp. . . 64, 104, 129
MSS Group Inc. 32
Oracle Corp. 64
Palm Inc. 104
PeopleSoft Inc. 64
Radio Systems Corp. . . . 104
RFD Systems 32
Rock-Tenn Co. 64
SAP America Inc. 64
Sapient Corp. 64
Tarantella Inc. 129
Teldata Control Inc. 32
Textron Financial Corp. . . 86
Textron Inc. 86
Unique Solutions 104
ViewSonic Corp. 64
Yankee Group, The 104

ADVERTISER INDEX

AMS 102, 103
Autodesk Inc. 131
BearingPoint Inc. 135

Berbee Information Networks Corp. 15
BlackBerry 123
BMC Software 12
Broadcom Corp. 8
BT 111
Business Objects Inc. . . . 81
Canon 17
CXO Media Inc. 23, 95, 107, 137, 138, 141
Cisco Systems Inc. 38
Citrix Systems Inc. 11
Cognos Inc. 75
Computer Associates Intl. Inc. C4, 7
Compuware Corp. 46
Dell Inc. 125
Diversified Software 113
EDS Corp. 29
Enterasys Networks 33
Fujitsu PC Corp. 41
IBM Corp. C2, 49, 62, 76
Information Builders 52
Intel Corp. 30
Internet Security Systems . . 27
Johnson Controls 118
Keane Inc. C3
Konica Minolta 121
Kyocera Mita Corp. 59
LEGATO 83, 133

META Group Inc. 57
NEC Solutions 24
NetIQ Corp. 99
Network Associates Inc. . . . 2
Nextel Communications Inc. . 51
NextiraOne 45
Onyx Software Corp. 117
Panasonic Computer Solutions Company 43
Peerstone Research 128
Primavera Systems Inc. . . 127
Protiviti Inc. 67
Quantum DLTape 114, 115
Remedy, a BMC Software Company 85
Resources Connection 55
Samsung 61
Savin Corp. 71
SkyTel Corp. 35
Software AG 73
Sprint 89, 91
SSH 101
Sungard Availability Services (regional) 107
VeriSign Inc. 93
Veritas 37
Xerox Corp. 4



CONGRATULATIONS TO THE WINNERS OF THE 2004 CIO ENTERPRISE VALUE AWARDS!®

Academic Management Services

Ace Hardware Corporation

Chicago Police Department

Continental Airlines

Dell Computer

Guardian Life Insurance Company
of America

Korn/Ferry International

Pfizer Global Research & Development

Procter & Gamble Company

Worldspan LP

And congratulations to this year's runners up!

Health Choice Network

Nortel Networks Corporation

The Office of the Air Force Surgeon General, Air Force Medical Services Corp.

Walker Information

World Bank Group

Come hear directly from these winners how they achieved the most value for their companies at the Enterprise Value Retreat and Award Ceremony, February 8-10, 2004, at the Trump International Sonesta Beach Resort in Sunny Isles, Florida. (See page 140)

New this year, the winner of the Grand CIO Enterprise Value Award will be revealed at the event, as well as in the February 15th edition of CIO magazine.

This year's Enterprise Value Retreat Awards Ceremony is proudly underwritten by



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EXECUTIVE

Summaries

November 15, 2003

COVER STORY

Extreme ERP Makeover

By Ben Worthen | 64

ERP vendors are urging CIOs to rip out the multiple systems their companies use today and replace them with one ERP system—with one data store—that serves the entire company. Single instance may be more achievable now than it was in the 1990s because of the availability of bandwidth, the viability of enterprise-size databases and lower storage costs. But it still won't be cheap: AMR Research predicts that moving to single instance will cost \$7 million to \$12 million for every billion dollars of revenue, and projects will take one to three years. Organizations willing to plow ahead regardless will see their total cost of ownership decline, since maintenance costs may be lower for single instance than for multiple point applications. Also, with single instance, all of a company's financial data will live in one application and will originate from one source, making it easier to comply with Sarbanes-Oxley requirements, eliminate consolidation errors and greatly reduce the time it takes to close the books. Although as many as 65 percent of U.S. companies are considering ERP consolidation as part of their efforts to comply with the new financial reporting requirements, others have decided to stick with multiple apps and use Web services as a cheap way to integrate them.

"The systems that each business unit has now work, and the worst thing to do is throw away what's working in order to get to the end-of-the-rainbow utopia."

—LARRY SHUTZBERG, CIO, ROCK-TENN

At Risk Offshore

By Michael Fitzgerald | 78

THE SURGE IN OFFSHORE OUTSOURCING opens up new channels of industrial espionage in poor nations that often don't have laws protecting foreign companies—and rarely enforce laws that may exist. Court cases are still relatively scarce, but the first prosecutorial filing for outsourcing-related intellectual property theft in India may come to trial by year's end. India, obviously eager to protect its income from outsourcing, is scrambling to demonstrate that it takes foreign intellectual property seriously. But CIOs and CSOs need to reexamine their own contracts to make sure they aren't at risk of becoming the test cases. Due diligence includes checking for network vulnerability and ensuring that if competitors do business with the same outsourcer, there is no contact between teams.

41 Business Units, Nine CIOs, One Standard

By Stephanie Overby | 86

TEXTRON, A \$10.7 BILLION GLOBAL CONGLOMERATE of 41 business units, is spending roughly \$320 million to create an IT shared services organization to introduce standards and consolidation. It's a tough challenge: Each Textron company has its own IT management processes, pet applications and disparate technology standards. Nine of the business units have their own CIOs, and each business unit has its own special set of needs. The rules of thumb will be to start small, get successes and build in shared services only where appropriate. Textron identifies three critical success factors: good governance, solid relationships with the businesses and total compliance to the vision. For governance, CIO Ken Bohlen set up the Information Management Council populated with corporate and business unit CIOs. He spends about 65 percent of his time on building relationships with IT and business folks. And there's Textron's zero-tolerance position on compliance: Everyone must make whatever investment is required to meet the new enterprisewide standards.

How to Play to Your Audience

By Meridith Levinson | 96

MANY B2C AND B2B E-COMMERCE SITES have become overloaded with information, leading to confused navigation, grandfathered dead ends and ultimately frustrated end users. Worse, the site might be playing to the wrong audience, especially if the business model has changed or the audience has matured. When one company, Medco Health Solutions, needed to update its website, it used a process called persona-based design, which puts customers at the center of discussions on designing user interfaces. Medco Health's redesign team created four fictional characters whose lives and ailments were based on real customers. With these characters as a focal point, Medco developers worked from a unified perspective. Using this method, Medco Health found fewer problems to fix after running usability tests. The real return on the redesign has come from retaining existing customers, attracting new ones and driving sales.

Case Files: No Frills Wireless

By Michael E. Kanell | 104

THE GREATEST BARRIER TO ENTERPRISE MOBILE SOLUTIONS is identifying the business value. Very often, companies grapple with the decision to integrate the latest and greatest wireless connectivity into their remote solutions. Chuck Latham Associates made the decision to forgo real-time wireless connectivity on the basis of its business requirements. For the company, which captures product merchandising data and feeds it to its manufacturer customers, the value of the mobile solution was the efficient and effective collection of information, rather than the instantaneous transfer of that information. So for the time being, a PDA mobile device for capturing product data from store shelves and displays is the right technology choice for the company. And, who knows—scheduling challenges for its remote salespeople could be addressed by a real-time wireless application.

A person is shown from behind, floating in the ocean. They are wearing a white life preserver and a dark cap. The water is dark and turbulent, with white foam from the waves. The person appears to be struggling, with their arms outstretched. The overall tone is somber and emphasizes the difficulty of retrieving something once it's lost at sea.

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